

SEQUENCE LISTING

5 <110> Stocker, Penny J.  
Steimel-Crespi, Dorothy T.  
Crespi, Charles L.  
Rief, Timothy C  
Patten, Christopher J.

10 <120> P-GLYCOPROTEINS AND USES THEREOF

15 <130> G0307/7017  
<150> US 60/156,510  
<151> 1999-09-28

20 *Sub* <160> 32

25 . <170> FastSEQ for Windows Version 3.0

30 <210> 1  
<211> 4279  
<212> DNA  
<213> Canis familiaris

35 <220>  
<221> CDS  
<222> (17)...(3859)

40 <400> 1  
ggagcgcgag gtcggg atg gat cct gaa gga ggc cgt aag ggg agt gca gag 52  
Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu  
1 5 10

45 aag aac ttc tgg aaa atg ggc aaa aaa agt aaa aaa aat gag aag aaa 100  
Lys Asn Phe Trp Lys Met Gly Lys Lys Ser Lys Lys Asn Glu Lys Lys  
15 20 25

50 gaa aag aaa cca act gtc acg acg ttt gca atg ttt cgc tat tca aat 148  
Glu Lys Pro Thr Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn  
30 35 40

55 tgg ctt gat agg ttg tat atg ttg gtg ggg aca atg gct gcc atc atc 196  
Trp Leu Asp Arg Leu Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile  
45 50 55 60

60 cat gga gct gca ctc cct ctc atg atg ctg gtt ttt gga aac atg aca 244  
His Gly Ala Ala Leu Pro Leu Met Met Leu Val Phe Gly Asn Met Thr  
50 55 65 70 75

65 gat agc ttt gca aat gca gga att tca aga aac aaa act ttt cca gtt 292  
Asp Ser Phe Ala Asn Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val  
80 85 90

70 ata att aat gaa agt att acg aac aat aca caa cat ttc atc aac cat 340  
Ile Ile Asn Glu Ser Ile Thr Asn Asn Thr Gln His Phe Ile Asn His  
95 100 105

75 80 85 90 95 100 105

80 85 90 95 100 105

85 90 95 100 105

90 95 100 105

95 100 105

100 105

105

110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890

|    |  |      |
|----|--|------|
|    | Leu Glu Glu Glu Met Thr Thr Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly  |      |
|    | 110 115 120  |      |
| 5  | gct ggc gtg ctg gtg gct tac atc cag gtt tca ttc tgg tgc ctg<br>Ala Gly Val Leu Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu     | 436  |
|    | 125 130 135 140  |      |
| 10 | gca gca gga aga cag ata ctc aaa att aga aaa caa ttt ttt cat gct<br>Ala Ala Gly Arg Gln Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala | 484  |
|    | 145 150 155  |      |
|    | atc atg cga cag gag att ggc tgg ttt gac gtg cat gac gtt ggg gag<br>Ile Met Arg Gln Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu | 532  |
|    | 160 165 170  |      |
| 15 | ctt aac acc cgg ctc aca gac gat gtc tcc aaa atc aat gaa gga att<br>Leu Asn Thr Arg Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile | 580  |
|    | 175 180 185  |      |
| 20 | ggc gac aaa att gga atg ttc ttt cac tca ata gca aca ttt ttc acc<br>Gly Asp Lys Ile Gly Met Phe Phe His Ser Ile Ala Thr Phe Phe Thr | 628  |
|    | 190 195 200  |      |
| 25 | ggt ttt ata gtg ggg ttt aca cgt ggt tgg aag cta acc ctt gtg att<br>Gly Phe Ile Val Gly Phe Thr Arg Gly Trp Lys Leu Thr Leu Val Ile | 676  |
|    | 205 210 215 220  |      |
| 30 | tgg gcc atc agc cct gtt ctt gga ctt tca gcc gcc atc tgg gca aag<br>Leu Ala Ile Ser Pro Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys | 724  |
|    | 225 230 235  |      |
|    | ata cta tct tca ttt act gat aaa gaa ctc ttg gcc tat gca aaa gct<br>Ile Leu Ser Ser Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala | 772  |
|    | 240 245 250  |      |
| 35 | gga gca gta gct gaa gaa gtc tta gca gca atc aga act gtg att gcc<br>Gly Ala Val Ala Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala | 820  |
|    | 255 260 265  |      |
| 40 | ttt gga gga caa aag aaa gaa ctt gaa agg tac aac aaa aat tta gaa<br>Phe Gly Gly Gln Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu | 868  |
|    | 270 275 280  |      |
| 45 | gaa gct aaa gga att ggg ata aag aaa gct atc acg gcc aac att tct<br>Glu Ala Lys Gly Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser | 916  |
|    | 285 290 295 300  |      |
| 50 | att ggt gcc gct ttc tta ttg atc tat gca tca tat gct ctg gct ttc<br>Ile Gly Ala Ala Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe | 964  |
|    | 305 310 315  |      |
|    | tgg tat ggg acc tcc ttg gtc ctc tcc agt gaa tat tct att gga caa<br>Trp Tyr Gly Thr Ser Leu Val Leu Ser Ser Glu Tyr Ser Ile Gly Gln | 1012 |
|    | 320 325 330  |      |
| 55 | gta ctc act gtc ttc ttt tct gta tta att ggg gct ttt agt att gga<br>Val Leu Thr Val Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly | 1060 |
|    | 335 340 345  |      |
| 60 | cag gca tcc cca agc att gaa gca ttt gca aac gca aga gga gca gct  | 1108 |

|    |  |     |     |     |     |     |      |
|----|--|-----|-----|-----|-----|-----|------|
|    | Gln Ala Ser Pro Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala  |     |     |     |     |     |      |
|    | 350  | 355 | 360 |     |     |     |      |
| 5  | tat gaa atc ttc aag ata att gac aat aaa cca agc att gac agc tat<br>Tyr Glu Ile Phe Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr |     | 365 | 370 | 375 | 380 | 1156 |
| 10 | tcg aag agt gga cat aaa cca gat aat att aag gga aat ttg gaa ttc<br>Ser Lys Ser Gly His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe |     | 385 | 390 | 395 |     | 1204 |
| 15 | aaa aat gtt cac ttc agt tac cct tct cga aaa gaa gtt aag atc tta<br>Lys Asn Val His Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu |     | 400 | 405 | 410 |     | 1252 |
| 20 | aag ggt ctc aac ctg aag gtt cag agt ggg cag aca gtg gcg ctg gtt<br>Lys Gly Leu Asn Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val |     | 415 | 420 | 425 |     | 1300 |
| 25 | ggg aac agt ggc tgc ggg aag agc acg acc gtg cag ctg atg cag agg<br>Gly Asn Ser Gly Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg |     | 430 | 435 | 440 |     | 1348 |
| 30 | ctc tat gac ccc aca gat ggc atg gtc tgt att gat gga cag gac att<br>Leu Tyr Asp Pro Thr Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile |     | 445 | 450 | 455 | 460 | 1396 |
| 35 | agg acc ata aat gta agg cat ctt cgg gaa att act ggt gtg gtg agt<br>Arg Thr Ile Asn Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser |     | 465 | 470 | 475 |     | 1444 |
| 40 | cag gag cct gtg ttg ttt gcc acc acg ata gct gaa aac att cgc tat<br>Gln Glu Pro Val Leu Phe Ala Thr Ile Ala Glu Asn Ile Arg Tyr     |     | 480 | 485 | 490 |     | 1492 |
| 45 | ggc cgc gaa aat gtc acc atg gat gag att gag aaa gct gtt aag gaa<br>Gly Arg Glu Asn Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu |     | 495 | 500 | 505 |     | 1540 |
| 50 | gcc aat gcc tat gat ttt atc atg aaa cta cct aat aaa ttt gac act<br>Ala Asn Ala Tyr Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr |     | 510 | 515 | 520 |     | 1588 |
| 55 | ctg gtt gga gag aga ggg gcc cag ctg agt ggt gga cag aaa cag aga<br>Leu Val Gly Glu Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg |     | 525 | 530 | 535 | 540 | 1636 |
| 60 | atc gcc att gct cgg gcc ctg gtt cgc aac ccc aag att ctt ctg ctg<br>Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Leu |     | 545 | 550 | 555 |     | 1684 |
|    | gat gag gca acg tca gct ctg gac act gaa agt gaa gca gtg gtt cag<br>Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln |     | 560 | 565 | 570 |     | 1732 |
|    | gtg gcc ctg gat aag gcc aga aaa ggc cgg act acc att gtg ata gct<br>Val Ala Leu Asp Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala |     | 575 | 580 | 585 |     | 1780 |
|    | cat cgt ttg tct aca gtt cgt aat gcc gat gtc att gct ggt ttt gat  |     |     |     |     |     | 1828 |

|    |  |     |      |
|----|--|-----|------|
|    | His Arg Leu Ser Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp  |     |      |
|    | 590  | 595 | 600  |
| 5  | gat gga gtc att gtg gag aaa gga aat cat gat gaa ctc atg aaa gag<br>Asp Gly Val Ile Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu |     | 1876 |
|    | 605  | 610 | 615  |
| 10 | aag ggc att tac ttc aaa ctt gtc aca atg cag aca aga gga aat gaa<br>Lys Gly Ile Tyr Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu |     | 1924 |
|    | 625  | 630 | 635  |
|    | att gag tta gaa aat gcc act ggt gaa tcc aaa agt gaa agt gat gcc<br>Ile Glu Leu Glu Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala |     | 1972 |
|    | 640  | 645 | 650  |
| 15 | ttg gaa atg tct cca aaa gat tca ggg tcc agt tta ata aaa aga aga<br>Leu Glu Met Ser Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg |     | 2020 |
|    | 655  | 660 | 665  |
| 20 | tca act cgc agg agt ata cat gca cca caa ggc caa gac aga aag ctt<br>Ser Thr Arg Arg Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu |     | 2068 |
|    | 670  | 675 | 680  |
| 25 | ggt aca aaa gag gac ttg aat gag aat gta cct cca gtt tcc ttc tgg<br>Gly Thr Lys Glu Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp |     | 2116 |
|    | 685  | 690 | 695  |
| 30 | agg att ctg aag ctg aac tca act gaa tgg cct tat ttt gtg gtt ggt<br>Arg Ile Leu Lys Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly |     | 2164 |
|    | 705  | 710 | 715  |
|    | ata ttt tgt gct att ata aac gga ggc ctg caa cca gca ttt tca ata<br>Ile Phe Cys Ala Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile |     | 2212 |
|    | 720  | 725 | 730  |
| 35 | ata ttt tca agg att ata ggg atc ttt acc cga gat gag gat cct gaa<br>Ile Phe Ser Arg Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu |     | 2260 |
|    | 735  | 740 | 745  |
| 40 | aca aaa cga cag aat agt aac atg ttt tct gta ttg ttt cta gtc ctt<br>Thr Lys Arg Gln Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu |     | 2308 |
|    | 750  | 755 | 760  |
| 45 | gga att att tct ttt att aca ttt ttc ctc cag ggc ttc aca ttt ggc<br>Gly Ile Ile Ser Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly |     | 2356 |
|    | 765  | 770 | 775  |
| 50 | aaa gct ggg gag atc ctc act aag cgg ctt cga tac atg gtt ttc aga<br>Lys Ala Gly Glu Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg |     | 2404 |
|    | 785  | 790 | 795  |
|    | tcc atg ctg aga cag gat gtc agc tgg ttt gat gac cct aaa aac acc<br>Ser Met Leu Arg Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr |     | 2452 |
|    | 800  | 805 | 810  |
| 55 | act gga gca ttg aca acc agg ctt gcc aat gat gcg gct caa gtt aaa<br>Thr Gly Ala Leu Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys |     | 2500 |
|    | 815  | 820 | 825  |
| 60 | ggg gct ata ggt tcc agg ctt gct gtc att acc cag aat ata gca aat  |     | 2548 |

|    |   |      |      |
|----|---|------|------|
|    | Gly Ala Ile Gly Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn |      |      |
|    | 830   | 835  | 840  |
| 5  | Leu Gly Thr Gly Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr     |      | 2596 |
|    | 845   | 850  | 855  |
|    | 860   |      |      |
| 10 | ctt tta ctc tta gca att gta ccc atc att gca ata gca gga gtt gtt |      | 2644 |
|    | Leu Leu Leu Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val     |      |      |
|    | 865   | 870  | 875  |
|    | gaa atg aaa atg ttg tct gga caa gca ctg aaa gat aag aaa gag cta |      | 2692 |
|    | Glu Met Lys Met Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu |      |      |
| 15 | 880   | 885  | 890  |
|    | gaa gga gct ggg aag att gct aca gaa gcc atc gaa aac ttc cga act |      | 2740 |
|    | Glu Gly Ala Gly Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr |      |      |
|    | 895   | 900  | 905  |
| 20 | gtt gtt tct ttg act cgg gag cag aag ttt gaa tac atg tat gca cag |      | 2788 |
|    | Val Val Ser Leu Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln |      |      |
|    | 910   | 915  | 920  |
| 25 | agt ttg caa gta cca tac aga aac tct ttg agg aaa gca cac atc ttc |      | 2836 |
|    | Ser Leu Gln Val Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe |      |      |
|    | 925   | 930  | 935  |
|    | 940   |      |      |
| 30 | 945   | 950  | 955  |
|    | ggg gtc tca ttt tct atc acc cag gca atg atg tat ttt tcc tat gct |      | 2884 |
|    | Gly Val Ser Phe Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala |      |      |
|    | 950   | 955  |      |
| 35 | 960   | 965  | 970  |
|    | ggc tgt ttc cgg ttt ggt gcc tac ttg gtg gca aat gag ttc atg aac |      | 2932 |
|    | Gly Cys Phe Arg Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn |      |      |
|    | 965   | 970  |      |
| 40 | ttt cag gat gtt ctt ttg gta ttc tca gct att gtc ttt ggt gcc atg |      | 2980 |
|    | Phe Gln Asp Val Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met |      |      |
|    | 975   | 980  | 985  |
|    | 990   |      |      |
| 45 | 995   | 1000 |      |
|    | gca gtg ggg cag gtc agt tca ttt gct cct gac tat gcc aaa gcc aaa |      | 3028 |
|    | Ala Val Gly Gln Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys |      |      |
|    | 1000  |      |      |
| 50 | 1005  | 1010 | 1015 |
|    | 1020  |      |      |
|    | 1025  | 1030 | 1035 |
|    | 1035  |      |      |
| 55 | gac agc tac agc cct cac ggc ctc aag cca aat acg ttg gaa gga aat |      | 3124 |
|    | Asp Ser Tyr Ser Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn |      |      |
|    | 1040  | 1045 | 1050 |
|    | 1050  |      |      |
|    | 1055  | 1060 | 1065 |
| 60 | ccc gtg ctc cag ggg ctg agc ctc gag gtg aag aag ggc cag acg ctg |      | 3220 |
|    | Pro Val Leu Gln Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu |      |      |
|    | 1060  | 1065 |      |
|    | 1065  |      |      |
|    | gcc ctc gta ggt agc agt ggc tgt ggg aag agc aca gtt gtt cag ctc |      | 3268 |
|    |   |      |      |

|    |  |                                      |
|----|--|--------------------------------------|
|    | Ala Leu Val Gly Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu  |                                      |
|    | 1070 1075 1080   |                                      |
| 5  | ctc gag cgc ttc tat gac ccc ttg gct ggt tca gtg cta att gat ggc<br>Leu Glu Arg Phe Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly<br>1085 1090 1095 1100  | 3316                                 |
| 10 | aaa gag ata aag cac ctg aat gtc cag tgg ctc cga gca cac ctg ggc<br>Lys Glu Ile Lys His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly<br>1105 1110 1115   | 3364                                 |
| 15 | atc gtg tct cag gag ccc atc ctg ttt gac tgc agc att gcc gag aac<br>Ile Val Ser Gln Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn<br>1120 1125 1130   | 3412                                 |
| 20 | att gcc tat gga gac aac agc cgg gtc gta tca cat gaa gag att atg<br>Ile Ala Tyr Gly Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Met<br>1135 1140 1145   | 3460                                 |
| 25 | cag gca gcc aag gag gcc aac ata cac cac ttc atc gag aca ctc cct<br>Gln Ala Ala Lys Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro<br>1150 1155 1160   | 3508                                 |
| 30 | gag aaa tac aac acc aga gta gga gac aaa gga acc cag ctc tct ggt<br>Glu Lys Tyr Asn Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly<br>1165 1170 1175 1180  | 3556                                 |
| 35 | ggc cag aaa cag cgc att gcc ata gct cgc gct ctt gtt aga cag cct<br>Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro<br>1185 1190 1195   | 3604                                 |
| 40 | cat att ttg ctt ttg gat gaa gct aca tca gct ctg gat aca gaa agt<br>His Ile Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser<br>1200 1205 1210   | 3652                                 |
| 45 | gaa aag gtt gtc caa gaa gcc ctg gac aaa gcc aga gaa ggc cgc acc<br>Glu Lys Val Val Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr<br>1215 1220 1225   | 3700                                 |
| 50 | tgc att gtg atc gcc cac cgc ttg tcc acc atc cag aat gca gat tta<br>Cys Ile Val Ile Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu<br>1230 1235 1240   | 3748                                 |
| 55 | ata gtg gtg ttt cag aat ggc aaa gtc aag gag cat ggc aca cat caa<br>Ile Val Val Phe Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln<br>1245 1250 1255 1260  | 3796                                 |
| 60 | cag ctg ctg gcc cag aaa ggc atc tat ttt tcc atg gtc agt gtc cag<br>Gln Leu Leu Ala Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln<br>1265 1270 1275   | 3844                                 |
|    | gct gga gca aag cgc tagtgaactg tggccatatg agctgttaaa tatttttaa<br>Ala Gly Ala Lys Arg<br>1280  | 3899                                 |
|    | tatttgttaaa acatggc atttaatcaa agttaaaaagg tgagcactta ctggaaaaac<br>tatgtagaac tacctgttta acatttcttg ctgcaactga agatcattcc accaagttca<br>gagtcttcag atttataat taaaggaacc aaaagaaca ttatctgtatg gaataaaaata<br>ctgggtttaa ttgcattata aaattataga gtaattcaa gtagattttg ttaataaaatt<br>gtataatttt tgtttatatt ttatttgtaa cttaactgct tgctgaaaga ttatagaagt | 3959<br>4019<br>4079<br>4139<br>4199 |

ggtaaaaaagt actgaatgtt tgaataaaagt gctagctata ataaaactaa acttttatat 4259  
 caaaaaaaaaaaa aaaaaaaaaaa

|   |   |
|---|---|
| 5 | <210> 2<br><211> 1281<br><212> PRT<br><213> Canis familiaris  |
|   | <br>10 Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu Lys Asn Phe Trp<br>1               5               10               15<br>Lys Met Gly Lys Lys Ser Lys Lys Asn Glu Lys Lys Glu Lys Lys Pro<br>20               25               30<br>Thr Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn Trp Leu Asp Arg<br>35               40               45<br>Leu Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile His Gly Ala Ala<br>50               55               60<br>Leu Pro Leu Met Met Leu Val Phe Gly Asn Met Thr Asp Ser Phe Ala<br>65               70               75               80<br>20 Asn Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val Ile Ile Asn Glu<br>85               90               95<br>Ser Ile Thr Asn Asn Thr Gln His Phe Ile Asn His Leu Glu Glu Glu<br>100              105              110<br>Met Thr Thr Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu<br>115              120              125<br>25 Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg<br>130              135              140<br>Gln Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln<br>145              150              155              160<br>30 Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg<br>165              170              175<br>Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Ile<br>180              185              190<br>Gly Met Phe Phe His Ser Ile Ala Thr Phe Phe Thr Gly Phe Ile Val<br>195              200              205<br>35 Gly Phe Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser<br>210              215              220<br>Pro Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys Ile Leu Ser Ser<br>225              230              235              240<br>40 Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala<br>245              250              255<br>Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln<br>260              265              270<br>45 Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Ala Lys Gly<br>275              280              285<br>Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala<br>290              295              300<br>Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr<br>305              310              315              320<br>50 Ser Leu Val Leu Ser Ser Glu Tyr Ser Ile Gly Gln Val Leu Thr Val<br>325              330              335<br>Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly Gln Ala Ser Pro<br>340              345              350<br>55 Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe<br>355              360              365<br>Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly<br>370              375              380<br>His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Lys Asn Val His<br>385              390              395              400<br>60 Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn |

|    |   |     |     |
|----|---|-----|-----|
|    | 405   | 410 | 415 |
|    | Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly |     |     |
|    | 420   | 425 | 430 |
| 5  | Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro |     |     |
|    | 435   | 440 | 445 |
|    | Thr Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile Arg Thr Ile Asn |     |     |
|    | 450   | 455 | 460 |
|    | Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser Gln Glu Pro Val |     |     |
|    | 465   | 470 | 475 |
| 10 | Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn |     |     |
|    | 485   | 490 | 495 |
|    | Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr |     |     |
|    | 500   | 505 | 510 |
| 15 | Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr Leu Val Gly Glu |     |     |
|    | 515   | 520 | 525 |
|    | Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala |     |     |
|    | 530   | 535 | 540 |
|    | Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala Thr |     |     |
|    | 545   | 550 | 555 |
| 20 | Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp |     |     |
|    | 565   | 570 | 575 |
|    | Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser |     |     |
|    | 580   | 585 | 590 |
| 25 | Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile |     |     |
|    | 595   | 600 | 605 |
|    | Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr |     |     |
|    | 610   | 615 | 620 |
|    | Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu Ile Glu Leu Glu |     |     |
|    | 625   | 630 | 635 |
| 30 | Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met Ser |     |     |
|    | 645   | 650 | 655 |
|    | Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg Arg |     |     |
|    | 660   | 665 | 670 |
| 35 | Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys Glu |     |     |
|    | 675   | 680 | 685 |
|    | Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp Arg Ile Leu Lys |     |     |
|    | 690   | 695 | 700 |
|    | Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly Ile Phe Cys Ala |     |     |
|    | 705   | 710 | 715 |
| 40 | Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser Arg |     |     |
|    | 725   | 730 | 735 |
|    | Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg Gln |     |     |
|    | 740   | 745 | 750 |
| 45 | Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile Ser |     |     |
|    | 755   | 760 | 765 |
|    | Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu |     |     |
|    | 770   | 775 | 780 |
|    | Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg |     |     |
|    | 785   | 790 | 795 |
| 50 | Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu |     |     |
|    | 805   | 810 | 815 |
|    | Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly |     |     |
|    | 820   | 825 | 830 |
| 55 | Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly |     |     |
|    | 835   | 840 | 845 |
|    | Ile Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu     |     |     |
|    | 850   | 855 | 860 |
|    | Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met |     |     |
|    | 865   | 870 | 875 |
| 60 | Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly |     |     |
|    | 880   |     |     |

|    |   |      |      |
|----|---|------|------|
|    | 885   | 890  | 895  |
|    | Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu |      |      |
|    | 900   | 905  | 910  |
| 5  | Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln Ser Leu Gln Val |      |      |
|    | 915   | 920  | 925  |
|    | Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Val Ser Phe |      |      |
|    | 930   | 935  | 940  |
|    | Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg |      |      |
|    | 945   | 950  | 955  |
| 10 | Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn Phe Gln Asp Val |      |      |
|    | 965   | 970  | 975  |
|    | Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met Ala Val Gly Gln |      |      |
|    | 980   | 985  | 990  |
| 15 | Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala Ala |      |      |
|    | 995   | 1000 | 1005 |
|    | His Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile Asp Ser Tyr Ser |      |      |
|    | 1010  | 1015 | 1020 |
|    | Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Asn |      |      |
|    | 1025  | 1030 | 1035 |
| 20 | Glu Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln |      |      |
|    | 1045  | 1050 | 1055 |
|    | Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly |      |      |
|    | 1060  | 1065 | 1070 |
| 25 | Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe |      |      |
|    | 1075  | 1080 | 1085 |
|    | Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly Lys Glu Ile Lys |      |      |
|    | 1090  | 1095 | 1100 |
|    | His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln |      |      |
|    | 1105  | 1110 | 1115 |
| 30 | Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly |      |      |
|    | 1125  | 1130 | 1135 |
|    | Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Met Gln Ala Ala Lys |      |      |
|    | 1140  | 1145 | 1150 |
| 35 | Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro Glu Lys Tyr Asn |      |      |
|    | 1155  | 1160 | 1165 |
|    | Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln |      |      |
|    | 1170  | 1175 | 1180 |
|    | Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu |      |      |
|    | 1185  | 1190 | 1195 |
| 40 | Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val |      |      |
|    | 1205  | 1210 | 1215 |
|    | Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile |      |      |
|    | 1220  | 1225 | 1230 |
| 45 | Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe |      |      |
|    | 1235  | 1240 | 1245 |
|    | Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala |      |      |
|    | 1250  | 1255 | 1260 |
|    | Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Ala Lys |      |      |
|    | 1265  | 1270 | 1275 |
| 50 | Arg   |      | 1280 |

<210> 3  
 <211> 4317  
 55 <212> DNA  
 <213> Canis familiaris  
  
 <220>  
 <221> CDS  
 60 <222> (70)...(3912)

|    |   |           |
|----|---|-----------|
|    | <400> 3   |           |
| 5  | ctaaatcgga gtagtttattt cccaaattcc ctttcgggtg gaggttgcgaa aggaaaagccc<br>gagggtgacg atg gat cct gaa gga ggc cgt aag ggg agt gca gag aag aac<br>Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu Lys Asn<br>1 5 10 | 60<br>111 |
| 10 | tcc tgg aaa atg ggc aaa aaa agt aaa aaa gag aag aaa gaa aag aag aaa<br>Phe Trp Lys Met Gly Lys Lys Ser Lys Lys Glu Lys Lys Glu Lys Lys<br>15 20 25 30   | 159       |
| 15 | cca act gtc agc acg ttt gca atg ttt cgc tat tca aat tgg ctt gat<br>Pro Thr Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn Trp Leu Asp<br>35 40 45  | 207       |
|    | agg ttg tat atg ttg gtg ggg aca atg gct gcc atc atc cat gga gct<br>Arg Leu Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile His Gly Ala<br>50 55 60  | 255       |
| 20 | gca ctc cct ctc atg atg ctg gtt ttt gga aac atg aca gat agc ttt<br>Ala Leu Pro Leu Met Met Leu Val Phe Gly Asn Met Thr Asp Ser Phe<br>65 70 75  | 303       |
| 25 | gca aat gca gga att tca aga aac aaa act ttt cca gtt ata att aat<br>Ala Asn Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val Ile Ile Asn<br>80 85 90  | 351       |
| 30 | gaa agt att acg aac aat aca caa cat ttc atc aac cat ctg gag gag<br>Glu Ser Ile Thr Asn Asn Thr Gln His Phe Ile Asn His Leu Glu Glu<br>95 100 105 110  | 399       |
| 35 | gaa atg acc acg tat gcc tat tat tac agt ggg atc ggt gct ggc gtg<br>Glu Met Thr Thr Tyr Ala Tyr Tyr Ser Gly Ile Gly Ala Gly Val<br>115 120 125   | 447       |
| 40 | ctg gtg gct tac atc cag gtt tca ttc tgg tgc ctg gca gca gga<br>Leu Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly<br>130 135 140   | 495       |
| 45 | aga cag ata ctc aaa att aga aaa caa ttt ttt cat gct atc atg cga<br>Arg Gln Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg<br>145 150 155   | 543       |
| 50 | cag gag att ggc tgg ttt gac gtg cat gac gtt ggg gag ctt aac acc<br>Gln Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr<br>160 165 170   | 591       |
| 55 | cggtt ctc aca gac gat gtc tcc aaa atc aat gaa gga att ggc gac aaa<br>Arg Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys<br>175 180 185 190   | 639       |
|    | gtt gga atg ttc ttt caa tca ata gca aca ttt ttc acc ggt ttt ata<br>Val Gly Met Phe Phe Gln Ser Ile Ala Thr Phe Phe Thr Gly Phe Ile<br>195 200 205   | 687       |
|    | gtg ggg ttt aca cct ggt tgg aag cta acc ctt gtg att ttg gcc atc<br>Val Gly Phe Thr Pro Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile<br>210 215 220   | 735       |
| 60 | agc cct gtt ctt gga ctt tca gcc gcc atc tgg gca aag ata cta tct   | 783       |

|    |  |      |
|----|--|------|
|    | Ser Pro Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys Ile Leu Ser  |      |
|    | 225 230 235  |      |
| 5  | tca ttt act gat aaa gaa ctc ttg gcc tat gca aaa gct gga gca gta<br>Ser Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val | 831  |
|    | 240 245 250  |      |
| 10 | gct gaa gaa gtc tta gca gca atc aga act gtg att gcc ttt gga gga<br>Ala Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly | 879  |
|    | 255 260 265 270  |      |
| 15 | caa aag aaa gaa ctt gaa agg tac aac aaa aat tta gaa gaa gct aaa<br>Gln Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys | 927  |
|    | 275 280 285  |      |
| 20 | aga att ggg ata aag aaa gct atc acg gcc aac att tct att ggt gcc<br>Arg Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala | 975  |
|    | 290 295 300  |      |
| 25 | gct ttc tta ttg atc tat gca tca tat gct ctg gct ttc tgg tat ggg<br>Ala Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly | 1023 |
|    | 305 310 315  |      |
| 30 | acc tcc ttg gtc ctc tcc agt gaa tat act att gga cag gta ctc act<br>Thr Ser Leu Val Leu Ser Ser Glu Tyr Thr Ile Gly Gln Val Leu Thr | 1071 |
|    | 320 325 330  |      |
| 35 | gtc ttc ttt tct gta tta att ggg gct ttt agt att gga cag gca tcc<br>Val Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly Gln Ala Ser | 1119 |
|    | 335 340 345 350  |      |
| 40 | cca agc att gaa gca ttt gca aac gca aga gga gca gct tat gaa atc<br>Pro Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile | 1167 |
|    | 355 360 365  |      |
| 45 | ttc aag ata att gac aat aaa cca agc att gac agc tat tcg aag agt<br>Phe Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser | 1215 |
|    | 370 375 380  |      |
| 50 | gga cat aaa cca gat aat att aag gga aat ttg gaa ttc aaa aat gtt<br>Gly His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Lys Asn Val | 1263 |
|    | 385 390 395  |      |
| 55 | cac ttc agt tac cct tct cga aaa gaa gtt aag atc tta aag ggt ctc<br>His Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu | 1311 |
|    | 400 405 410  |      |
| 60 | aac ctg aag gtt cag agt ggg cag aca gtg gcg ctg gtt ggg aac agt<br>Asn Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser | 1359 |
|    | 415 420 425 430  |      |
| 65 | ggc tgc ggg aag agc acg acc gtg cag ctg atg cag agg ctc tat gac<br>Gly Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp | 1407 |
|    | 435 440 445  |      |
| 70 | ccc aca gat ggc atg gtc tgt att gat gga cag gac att agg acc ata<br>Pro Thr Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile Arg Thr Ile | 1455 |
|    | 450 455 460  |      |
| 75 | aat gta agg cat ctt cg gaa att act ggt gtg gtg agt cag gag cct   | 1503 |

|    |   |     |     |     |      |
|----|---|-----|-----|-----|------|
|    | Asn Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser Gln Glu Pro   | 465 | 470 | 475 |      |
| 5  | gtg ttg ttt gcc acc acg ata gct gaa aac att cgc tat ggc cgc gaa<br>Val Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu  | 480 | 485 | 490 | 1551 |
| 10 | aat gtc acc atg gat gag att gag aaa gct gtt aag gaa gcc aat gcc<br>Asn Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala  | 495 | 500 | 505 | 1599 |
| 15 | tat gat ttt atc atg aaa cta cct aat aaa ttt gac act ctg gtt gga<br>Tyr Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr Leu Val Gly  | 515 | 520 | 525 | 1647 |
| 20 | gag aga ggg gcc cggt ggt gga cag aaa cag aga atc gcc att<br>Glu Arg Gly Ala Arg Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile         | 530 | 535 | 540 | 1695 |
| 25 | gct cgg gcc ctg gtt cgc aac ccc aag att ctt ctg ctg gat gag gca<br>Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Asp Glu Ala      | 545 | 550 | 555 | 1743 |
| 30 | acg tca gct ctg gac act gaa agt gaa gca gtg gtt cag gtg gcc ctg<br>Thr Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu  | 560 | 565 | 570 | 1791 |
| 35 | gat aag gcc aga aaa ggc cggt act acc att gtg ata gct cat cgt ttg<br>Asp Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu | 575 | 580 | 585 | 1839 |
| 40 | tct aca gtt cgt aat gcc gat gtc att gct ggt ttt gat gat gga gtc<br>Ser Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val  | 595 | 600 | 605 | 1887 |
| 45 | att gtg gag aaa gga aat cat gat gaa ctc atg aaa gag aag ggc att<br>Ile Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile  | 610 | 615 | 620 | 1935 |
| 50 | tac ttc aaa ctt gtc aca atg cag aca aga gga aat gaa att gag tta<br>Tyr Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu Ile Glu Leu  | 625 | 630 | 635 | 1983 |
| 55 | gaa aat gcc act ggt gaa tcc aaa agt gaa agt gat gcc ttg gaa atg<br>Glu Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met  | 640 | 645 | 650 | 2031 |
| 60 | tct cca aaa gat tca ggg tcc agt tta ata aaa aga aga tca act cgc<br>Ser Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg  | 655 | 660 | 665 | 2079 |
| 65 | agg agt ata cat gca cca caa ggc caa gac aga aag ctt ggt aca aaa<br>Arg Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys  | 675 | 680 | 685 | 2127 |
| 70 | gag gac ttg aat gag aat gtt cct tca gtt tcc ttc tgg agg att ctg<br>Glu Asp Leu Asn Glu Asn Val Pro Ser Val Ser Phe Trp Arg Ile Leu  | 690 | 695 | 700 | 2175 |
| 75 | aag ctg aac tca act gaa tgg cct tat ttt gtg gtt ggt ata ttt tgt   |     |     |     | 2223 |

|    |  |     |      |
|----|--|-----|------|
|    | Lys Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly Ile Phe Cys  |     |      |
|    | 705  | 710 | 715  |
| 5  | gct att ata aac gga ggc ctg caa cca gca ttt tca ata ata ttt tca<br>Ala Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser |     | 2271 |
|    | 720  | 725 | 730  |
| 10 | agg att ata ggg atc ttt acc cga gat gag gat cct gaa aca aaa cga<br>Arg Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg |     | 2319 |
|    | 735  | 740 | 745  |
|    | cag aat agt aac atg ttt tct gta ttg ttt cta gtc ctt gga att att<br>Gln Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile |     | 2367 |
|    | 755  | 760 | 765  |
| 15 | tct ttt att aca ttt ttc ctc cag ggc ttc aca ttt ggc aaa gct ggg<br>Ser Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly |     | 2415 |
|    | 770  | 775 | 780  |
| 20 | gag atc ctc act aag cgg ctt cga tac atg gtt ttc aga tcc atg ctg<br>Glu Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu |     | 2463 |
|    | 785  | 790 | 795  |
| 25 | aga cag gat gtc agc tgg ttt gat gac cct aaa aac acc act gga gca<br>Arg Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala |     | 2511 |
|    | 800  | 805 | 810  |
| 30 | ttg aca acc agg ctt gcc aat gat gcg gct caa gtt aaa ggg gct ata<br>Leu Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile     |     | 2559 |
|    | 815  | 820 | 825  |
|    | 830  |     |      |
| 35 | ggt tcc agg ctt gtc att acc cag aat ata gca aat ctt ggg aca<br>Gly Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr     |     | 2607 |
|    | 835  | 840 | 845  |
|    |  |     |      |
| 40 | ggc att att ata tcc tta atc tat ggt tgg caa tta aca ctt tta ctc<br>Gly Ile Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu     |     | 2655 |
|    | 850  | 855 | 860  |
| 45 | 865  | 870 | 875  |
|    | tta gca att gta ccc atc att gca ata gca gga gtt gtt gaa atg aaa<br>Leu Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys |     | 2703 |
|    | 880  | 885 | 890  |
| 50 | atg ttg tct gga caa gca ctg aaa gat aag aaa gag cta gaa gga gct<br>Met Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala |     | 2751 |
|    | 895  | 900 | 905  |
|    | 910  |     |      |
| 55 | 915  | 920 | 925  |
|    | ttg act cgg gag cag aag ttt gaa tac atg tat gca cag agt ttg caa<br>Leu Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln Ser Leu Gln |     | 2847 |
|    | 930  | 935 | 940  |
| 60 | 935  | 940 |      |
|    | ttt tct atc acc cag gca atg atg tat ttt tcc tat gct ggc tgt ttc  |     | 2943 |

|    |  |      |      |      |      |
|----|--|------|------|------|------|
|    | Phe Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe  | 945  | 950  | 955  |      |
| 5  | cgg ttt ggt gcc tac ttg gtg gca aat gag ttc atg aac ttt cag gat<br>Arg Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn Phe Gln Asp | 960  | 965  | 970  | 2991 |
| 10 | gtt ctt ttg gta ttc tca gct att gtc ttt ggt gcc atg gca gtg ggg<br>Val Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met Ala Val Gly | 975  | 980  | 985  | 3039 |
| 15 | cag gtc agt tca ttt gct cct gac tat gcc aaa gcc aaa gta tca gca<br>Gln Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala | 995  | 1000 | 1005 | 3087 |
| 20 | gcc cac gtc atc atg atc att gaa aaa agc cct ctg att gac agc tac<br>Ala His Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile Asp Ser Tyr | 1010 | 1015 | 1020 | 3135 |
| 25 | agc cct cac ggc ctc aag cca aat acg ttg gaa gga aat gtg aca ttt<br>Ser Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe | 1025 | 1030 | 1035 | 3183 |
| 30 | aat gag gtc gtg ttc aac tat ccc act cga cca gac atc ccc gtg ctc<br>Asn Glu Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu | 1040 | 1045 | 1050 | 3231 |
| 35 | cag ggg ctg agc ctc gag gtg aag aag ggc cag acg ctg gcc ctc gta<br>Gln Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val | 1055 | 1060 | 1065 | 3279 |
| 40 | ggt agc agt ggc tgt ggg aag agc aca gtt gtt cag ctc cta gag cgc<br>Gly Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg | 1075 | 1080 | 1085 | 3327 |
| 45 | tcc tat gac ccc ttg gct ggt tca gtg cta att gat ggc aaa gag ata<br>Phe Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly Lys Glu Ile | 1090 | 1095 | 1100 | 3375 |
| 50 | aag cac ctg aat gtc cag tgg ctc cga gca cac ctg ggc atc gtg tct<br>Lys His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser | 1105 | 1110 | 1115 | 3423 |
| 55 | cag gag ccc atc ctg ttt gac tgc agc att gcc gag aac att gcc tat<br>Gln Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr | 1120 | 1125 | 1130 | 3471 |
| 60 | gga gac aac agc cgg gtc gta tca cat gaa gag att atg cag gca gcc<br>Gly Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Met Gln Ala Ala | 1135 | 1140 | 1145 | 3519 |
| 65 | aag gag gcc aac ata cac cac ttc atc gag aca ctc cct gag aaa tac<br>Lys Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro Glu Lys Tyr | 1155 | 1160 | 1165 | 3567 |
| 70 | aac acc aga gta gga gac aaa gga acc cag ctc tct ggt ggc cag aaa<br>Asn Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys | 1170 | 1175 | 1180 | 3615 |
| 75 | cag cgc att gcc ata gct cgc gct ctt gtt aga cag cct cat att ttg  |      |      |      | 3663 |

|    |   |      |
|----|---|------|
|    | Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu   |      |
|    | 1185 1190 1195  |      |
| 5  | ctt ttg gat gaa gct aca tca gct ctg gat aca gaa agt gaa aag gtt<br>Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val    | 3711 |
|    | 1200 1205 1210  |      |
| 10 | gtc caa gaa gcc ctg gac aaa gcc aga gaa ggc cgc acc tgc att gtg<br>Val Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val    | 3759 |
|    | 1215 1220 1225 1230   |      |
|    | atc gcc cac cgc ttg tcc acc atc cag aat gca gat tta ata gtg gtg<br>Ile Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val    | 3807 |
| 15 | 1235 1240 1245  |      |
|    | ttt cag aat ggc aaa gtc aag gag cat ggc aca cat caa cag ctg ctg<br>Phe Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln Gln Leu Leu    | 3855 |
|    | 1250 1255 1260  |      |
| 20 | gct cag aaa ggc atc tat ttt tcc atg atc agt gtc cag gct gga gca<br>Ala Gln Lys Gly Ile Tyr Phe Ser Met Ile Ser Val Gln Ala Gly Ala    | 3903 |
|    | 1265 1270 1275  |      |
| 25 | aag cgc tag tgaactgtgg ccatatgagc tgttaaatat ttttaatat<br>Lys Arg   | 3952 |
|    | 1280  |      |
| 30 | tttgttaaaa acatggcatt taatcaaagt taaaaggtga gcacttactg gaaaaactat<br>gtagaactac ctgttaaca tttcttgctg caactgaaga tcattccacc aagttcagag | 4012 |
|    | tcttcagatt ttataattaa agaaaccaa agaaacatta tctgatggaa taaaatattg  | 4072 |
|    | gtgttaattg cattataaaa ttatagagta attcaaagta gattttgtta ataaattgtta  | 4132 |
|    | taattttgtt ttatattttt tttgttaactt actgctttgc tggaaagattt tagaagtgg  | 4192 |
|    | aaaaagttactt gaatgtttga ataaagtgtctt agctataata aaactaaact ttttatatgaa  | 4252 |
| 35 | aaaaa   | 4312 |
|    | <210> 4   | 1    |
|    | <211> 1280  |      |
|    | <212> PRT   |      |
| 40 | <213> Canis familiaris  |      |
|    | <400> 4   |      |
|    | Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu Lys Asn Phe Trp   |      |
|    | 1 5 10 15   |      |
| 45 | Lys Met Gly Lys Lys Ser Lys Lys Glu Lys Lys Glu Lys Lys Pro Thr   |      |
|    | 20 25 30  |      |
|    | Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn Trp Leu Asp Arg Leu   |      |
|    | 35 40 45  |      |
|    | Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile His Gly Ala Ala Leu   |      |
|    | 50 55 60  |      |
| 50 | Pro Leu Met Met Leu Val Phe Gly Asn Met Thr Asp Ser Phe Ala Asn   |      |
|    | 65 70 75 80   |      |
|    | Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val Ile Ile Asn Glu Ser   |      |
|    | 85 90 95  |      |
| 55 | Ile Thr Asn Asn Thr Gln His Phe Ile Asn His Leu Glu Glu Met   |      |
|    | 100 105 110   |      |
|    | Thr Thr Tyr Ala Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu Val   |      |
|    | 115 120 125   |      |
|    | Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln   |      |
|    | 130 135 140   |      |
| 60 | Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln Glu   |      |

|    |                                     |   |         |     |
|----|-------------------------------------|---|---------|-----|
|    | 145                                 | 150                                     | 155     | 160 |
|    | Ile Gly Trp Phe Asp Val His Asp Val | Gly Glu Leu Asn Thr Arg                 | Leu     |     |
|    | 165                                 | 170                                     | 175     |     |
| 5  | Thr Asp Asp Val Ser Lys Ile Asn Glu | Gly Ile Gly Asp Lys Val Gly             |         |     |
|    | 180                                 | 185                                     | 190     |     |
|    | Met Phe Phe Gln Ser Ile Ala Thr Phe | Phe Thr Gly Ile Val Gly                 |         |     |
|    | 195                                 | 200                                     | 205     |     |
|    | Phe Thr Pro Gly Trp Lys Leu Thr     | Leu Val Ile Leu Ala Ile Ser Pro         |         |     |
| 10 | 210                                 | 215                                     | 220     |     |
|    | Val Leu Gly Leu Ser Ala Ala Ile Trp | Ala Lys Ile Leu Ser Ser Phe             |         |     |
|    | 225                                 | 230                                     | 235     | 240 |
|    | Thr Asp Lys Glu Leu Leu Ala Tyr     | Ala Lys Ala Gly Ala Val Ala Glu         |         |     |
|    | 245                                 | 250                                     | 255     |     |
| 15 | Glu Val Leu Ala Ala Ile Arg Thr     | Val Ile Ala Phe Gly Gly Gln Lys         |         |     |
|    | 260                                 | 265                                     | 270     |     |
|    | Lys Glu Leu Glu Arg Tyr Asn Lys     | Asn Leu Glu Ala Lys Arg Ile             |         |     |
|    | 275                                 | 280                                     | 285     |     |
|    | Gly Ile Lys Lys Ala Ile Thr         | Ala Asn Ile Ser Ile Gly Ala Ala Phe     |         |     |
|    | 290                                 | 295                                     | 300     |     |
| 20 | Leu Leu Ile Tyr Ala Ser Tyr         | Ala Leu Ala Phe Trp Tyr Gly Thr         | Ser     |     |
|    | 305                                 | 310                                     | 315     | 320 |
|    | Leu Val Leu Ser Ser Glu             | Tyr Thr Ile Gly Gln Val Leu Thr         | Val Phe |     |
|    | 325                                 | 330                                     | 335     |     |
| 25 | Phe Ser Val Leu Ile Gly Ala Phe     | Ser Ile Gly Gln Ala Ser Pro Ser         |         |     |
|    | 340                                 | 345                                     | 350     |     |
|    | Ile Glu Ala Phe Ala Asn Ala Arg     | Gly Ala Ala Tyr Glu Ile Phe Lys         |         |     |
|    | 355                                 | 360                                     | 365     |     |
|    | Ile Ile Asp Asn Lys Pro Ser         | Ile Asp Ser Tyr Ser Lys Ser Gly His     |         |     |
|    | 370                                 | 375                                     | 380     |     |
| 30 | Lys Pro Asp Asn Ile Lys Gly Asn     | Leu Glu Phe Lys Asn Val His Phe         |         |     |
|    | 385                                 | 390                                     | 395     | 400 |
|    | Ser Tyr Pro Ser Arg Lys Glu Val     | Lys Ile Leu Lys Gly Leu Asn Leu         |         |     |
|    | 405                                 | 410                                     | 415     |     |
|    | Lys Val Gln Ser Gly Gln Thr Val     | Ala Leu Val Gly Asn Ser Gly Cys         |         |     |
|    | 420                                 | 425                                     | 430     |     |
|    | Gly Lys Ser Thr Thr Val Gln Leu     | Met Gln Arg Leu Tyr Asp Pro Thr         |         |     |
|    | 435                                 | 440                                     | 445     |     |
|    | Asp Gly Met Val Cys Ile Asp         | Gly Gln Asp Ile Arg Thr Ile Asn Val     |         |     |
|    | 450                                 | 455                                     | 460     |     |
| 40 | Arg His Leu Arg Glu Ile Thr         | Gly Val Val Ser Gln Glu Pro Val         | Leu     |     |
|    | 465                                 | 470                                     | 475     | 480 |
|    | Phe Ala Thr Thr Ile Ala Glu Asn     | Ile Arg Tyr Gly Arg Glu Asn Val         |         |     |
|    | 485                                 | 490                                     | 495     |     |
| 45 | Thr Met Asp Glu Ile Glu Lys Ala     | Val Lys Glu Ala Asn Ala Tyr Asp         |         |     |
|    | 500                                 | 505                                     | 510     |     |
|    | Phe Ile Met Lys Leu Pro Asn Lys     | Phe Asp Thr Leu Val Gly Glu Arg         |         |     |
|    | 515                                 | 520                                     | 525     |     |
|    | Gly Ala Arg Leu Ser Gly             | Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg |         |     |
|    | 530                                 | 535                                     | 540     |     |
| 50 | Ala Leu Val Arg Asn Pro Lys         | Ile Leu Leu Asp Glu Ala Thr Ser         |         |     |
|    | 545                                 | 550                                     | 555     | 560 |
|    | Ala Leu Asp Thr Glu Ser Glu         | Ala Val Val Gln Val Ala Leu Asp         | Lys     |     |
|    | 565                                 | 570                                     | 575     |     |
| 55 | Ala Arg Lys Gly Arg Thr             | Thr Ile Val Ile Ala His Arg Leu Ser     | Thr     |     |
|    | 580                                 | 585                                     | 590     |     |
|    | Val Arg Asn Ala Asp Val Ile         | Ala Gly Phe Asp Asp Gly Val Ile Val     |         |     |
|    | 595                                 | 600                                     | 605     |     |
|    | Glu Lys Gly Asn His Asp             | Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe |         |     |
|    | 610                                 | 615                                     | 620     |     |
| 60 | Lys Leu Val Thr Met Gln             | Thr Arg Gly Asn Glu Ile Glu Leu Glu Asn |         |     |

|    |   |      |      |      |
|----|---|------|------|------|
|    | 625   | 630  | 635  | 640  |
|    | Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met Ser Pro |      |      |      |
|    | 645   | 650  | 655  | 655  |
| 5  | Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg Arg Ser |      |      |      |
|    | 660   | 665  | 670  | 670  |
|    | Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys Glu Asp |      |      |      |
|    | 675   | 680  | 685  | 685  |
|    | Leu Asn Glu Asn Val Pro Ser Val Ser Phe Trp Arg Ile Leu Lys Leu |      |      |      |
| 10 | 690   | 695  | 700  | 700  |
|    | Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly Ile Phe Cys Ala Ile |      |      |      |
|    | 705   | 710  | 715  | 720  |
|    | Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser Arg Ile |      |      |      |
|    | 725   | 730  | 735  | 735  |
| 15 | Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg Gln Asn |      |      |      |
|    | 740   | 745  | 750  | 750  |
|    | Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile Ser Phe |      |      |      |
|    | 755   | 760  | 765  | 765  |
|    | Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile |      |      |      |
| 20 | 770   | 775  | 780  | 780  |
|    | Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln |      |      |      |
|    | 785   | 790  | 795  | 800  |
|    | Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr |      |      |      |
|    | 805   | 810  | 815  | 815  |
| 25 | Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser |      |      |      |
|    | 820   | 825  | 830  | 830  |
|    | Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile |      |      |      |
|    | 835   | 840  | 845  | 845  |
|    | Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Leu Ala |      |      |      |
|    | 850   | 855  | 860  | 860  |
| 30 | Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu |      |      |      |
|    | 865   | 870  | 875  | 880  |
|    | Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys |      |      |      |
|    | 885   | 890  | 895  | 895  |
| 35 | Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr |      |      |      |
|    | 900   | 905  | 910  | 910  |
|    | Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln Ser Leu Gln Val Pro |      |      |      |
|    | 915   | 920  | 925  | 925  |
|    | Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Val Ser Phe Ser |      |      |      |
| 40 | 930   | 935  | 940  | 940  |
|    | Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe |      |      |      |
|    | 945   | 950  | 955  | 960  |
|    | Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn Phe Gln Asp Val Leu |      |      |      |
|    | 965   | 970  | 975  | 975  |
| 45 | Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met Ala Val Gly Gln Val |      |      |      |
|    | 980   | 985  | 990  | 990  |
|    | Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala Ala His |      |      |      |
|    | 995   | 1000 | 1005 | 1005 |
|    | Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile Asp Ser Tyr Ser Pro |      |      |      |
|    | 1010  | 1015 | 1020 | 1020 |
| 50 | His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Asn Glu |      |      |      |
|    | 1025  | 1030 | 1035 | 1040 |
|    | Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln Gly |      |      |      |
|    | 1045  | 1050 | 1055 | 1055 |
| 55 | Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly Ser |      |      |      |
|    | 1060  | 1065 | 1070 | 1070 |
|    | Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe Tyr |      |      |      |
|    | 1075  | 1080 | 1085 | 1085 |
|    | Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly Lys Glu Ile Lys His |      |      |      |
| 60 | 1090  | 1095 | 1100 | 1100 |
|    | Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln Glu |      |      |      |

|    |   |      |      |      |
|----|---|------|------|------|
|    | 1105  | 1110 | 1115 | 1120 |
|    | Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly Asp |      |      |      |
|    | 1125  | 1130 | 1135 |      |
| 5  | Asn Ser Arg Val Val Ser His Glu Glu Ile Met Gln Ala Ala Lys Glu |      |      |      |
|    | 1140  | 1145 | 1150 |      |
|    | Ala Asn Ile His His Phe Ile Glu Thr Leu Pro Glu Lys Tyr Asn Thr |      |      |      |
|    | 1155  | 1160 | 1165 |      |
| 10 | Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg |      |      |      |
|    | 1170  | 1175 | 1180 |      |
|    | Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu     |      |      |      |
|    | 1185  | 1190 | 1195 | 1200 |
|    | Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln |      |      |      |
|    | 1205  | 1210 | 1215 |      |
| 15 | Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile Ala |      |      |      |
|    | 1220  | 1225 | 1230 |      |
|    | His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe Gln |      |      |      |
|    | 1235  | 1240 | 1245 |      |
|    | Asn Gly Lys Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala Gln |      |      |      |
| 20 | 1250  | 1255 | 1260 |      |
|    | Lys Gly Ile Tyr Phe Ser Met Ile Ser Val Gln Ala Gly Ala Lys Arg |      |      |      |
|    | 1265  | 1270 | 1275 | 1280 |
|    | <br>  |      |      |      |
| 25 | <210> 5   |      |      |      |
|    | <211> 1107  |      |      |      |
|    | <212> DNA   |      |      |      |
|    | <213> Canis familiaris  |      |      |      |
|    | <br>  |      |      |      |
| 30 | <220>   |      |      |      |
|    | <221> CDS   |      |      |      |
|    | <222> (1)...(1107)  |      |      |      |
|    | <br>  |      |      |      |
|    | <400> 5   |      |      |      |
|    | acg tca gct ctg gac act gaa agt gaa gca gtg gtt cag gtg gcc ctg |      |      |      |
| 35 | Thr Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu |      |      |      |
|    | 1   | 5    | 10   | 15   |
|    | <br>  |      |      |      |
|    | gat aag gcc aga aaa ggc cgg act acc att gtg ata gct cat cgt ttg |      |      |      |
|    | Asp Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu |      |      |      |
| 40 | 20  | 25   | 30   |      |
|    | <br>  |      |      |      |
|    | tct aca gtt cgt aat gcc gat gtc att gct ggt ttt gat gat gga gtc |      |      |      |
|    | Ser Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val |      |      |      |
|    | 35  | 40   | 45   |      |
| 45 | att gtg gag aaa gga aat cat gat gaa ctc atg aaa gag aaa ggc att |      |      |      |
|    | Ile Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile |      |      |      |
|    | 50  | 55   | 60   |      |
|    | <br>  |      |      |      |
| 50 | tac ttc aaa ctt gtc aca atg cag aca aga gga aat gaa att gac tta |      |      |      |
|    | Tyr Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu Ile Asp Leu |      |      |      |
|    | 65  | 70   | 75   | 80   |
|    | <br>  |      |      |      |
| 55 | gaa aat gcc act ggt gaa tcc aaa agt gaa agt gat gcc ttg gaa atg |      |      |      |
|    | Glu Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met |      |      |      |
|    | 85  | 90   | 95   |      |
|    | <br>  |      |      |      |
| 60 | tct cca aaa gat tca ggg tcc agt tta ata aaa aga aga tca act cgc |      |      |      |
|    | Ser Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg |      |      |      |
|    | 100   | 105  | 110  |      |

|    |   |      |
|----|---|------|
|    | agg agt ata cat gca cca caa ggc caa gac aga aag ctt ggt aca aaa<br>Arg Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys<br>115 120 125     | 384  |
| 5  | gag gac ttg aat gag aat gta cct cca gtt tcc ttc tgg agg att ctg<br>Glu Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp Arg Ile Leu<br>130 135 140     | 432  |
| 10 | aag ctg aac tca act gaa tgg cct tat ttt gtg gtt ggt ata ttt tgt<br>Lys Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly Ile Phe Cys<br>145 150 155 160 | 480  |
| 15 | gct att ata aac gga ggc ctg cag cca gca ttt tca ata ata ttt tca<br>Ala Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser<br>165 170 175     | 528  |
| 20 | agg att ata ggg atc ttt acc cga gat gag gat cct gaa aca aaa cga<br>Arg Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg<br>180 185 190     | 576  |
| 25 | cag att agt aac atg ttt tct gta ttg ttt cta gtc ctt gga att att<br>Gln Ile Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile<br>195 200 205     | 624  |
| 30 | tct ttt att aca ttt ttc ctt cag ggt ttc aca ttt ggc aaa gct gga<br>Ser Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly<br>210 215 220     | 672  |
| 35 | gag atc ctc act aag cgg ctt cga tac atg gtt ttc aga tcc atg ctg<br>Glu Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu<br>225 230 235 240 | 720  |
| 40 | aga cag gat gtc agc tgg ttt gat gac ctt aaa aac acc act gga gca<br>Arg Gln Asp Val Ser Trp Phe Asp Asp Leu Lys Asn Thr Thr Gly Ala<br>245 250 255     | 768  |
| 45 | ttg acc acc agg ctt gcc aat gat gct gct caa gtt aaa ggg gct ata<br>Leu Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile<br>260 265 270         | 816  |
| 50 | ggt tcc agg ctt gtc att acc cag aat ata gca aat ctt ggg aca<br>Gly Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr<br>275 280 285         | 864  |
| 55 | ggc att att ata tcc tta atc tat ggt tgg caa tta aca ctt tta ctc<br>Gly Ile Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu<br>290 295 300     | 912  |
| 60 | tta gca att gta ccc atc att gca ata gca gga gtt gtt gaa atg aaa<br>Leu Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys<br>305 310 315 320 | 960  |
|    | atg ttg tct gga caa gca ctg aaa gat aag aaa gag cta gaa gga gct<br>Met Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala<br>325 330 335     | 1008 |
|    | ggg aag att gct aca gaa gcc atc gaa aac ttc cga act gtt gtt tct<br>Gly Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser<br>340 345 350     | 1056 |

ttg act cag gag cag aag ttt gaa cac atg tat gca cag agt ttg cag 1104  
 Leu Thr Gln Glu Gln Lys Phe Glu His Met Tyr Ala Gln Ser Leu Gln  
                  355                 360                 365

5 gta 1107

<210> 6  
<211> 368  
<212> PBT

10 <213> Canis familiaris

<400> 6

|    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|    | Thr | Ser | Ala | Leu | Asp | Thr | Glu | Ser | Glu | Ala | Val | Val | Gln | Val | Ala | Leu |
| 15 |     |     |     |     |     | 1   |     | 5   |     |     | 10  |     |     |     |     | 15  |
|    | Asp | Lys | Ala | Arg | Lys | Gly | Arg | Thr | Thr | Ile | Val | Ile | Ala | His | Arg | Leu |
|    |     |     |     |     |     | 20  |     |     |     | 25  |     |     |     |     | 30  |     |
|    | Ser | Thr | Val | Arg | Asn | Ala | Asp | Val | Ile | Ala | Gly | Phe | Asp | Asp | Gly | Val |
| 20 |     |     |     |     |     | 35  |     |     | 40  |     |     | 45  |     |     |     |     |
|    | Ile | Val | Glu | Lys | Gly | Asn | His | Asp | Glu | Leu | Met | Lys | Glu | Lys | Gly | Ile |
|    |     |     |     |     |     | 50  |     |     | 55  |     |     | 60  |     |     |     |     |
|    | Tyr | Phe | Lys | Leu | Val | Thr | Met | Gln | Thr | Arg | Gly | Asn | Glu | Ile | Asp | Leu |
|    |     |     |     |     |     | 65  |     | 70  |     | 75  |     |     |     |     | 80  |     |
|    | Glu | Asn | Ala | Thr | Gly | Glu | Ser | Lys | Ser | Glu | Ser | Asp | Ala | Leu | Glu | Met |
| 25 |     |     |     |     |     | 85  |     |     |     | 90  |     |     |     |     | 95  |     |
|    | Ser | Pro | Lys | Asp | Ser | Gly | Ser | Ser | Leu | Ile | Lys | Arg | Arg | Ser | Thr | Arg |
|    |     |     |     |     |     | 100 |     |     |     | 105 |     |     |     |     | 110 |     |
|    | Arg | Ser | Ile | His | Ala | Pro | Gln | Gly | Gln | Asp | Arg | Lys | Leu | Gly | Thr | Lys |
|    |     |     |     |     |     | 115 |     |     | 120 |     |     | 125 |     |     |     |     |
| 30 | Glu | Asp | Leu | Asn | Glu | Asn | Val | Pro | Pro | Val | Ser | Phe | Trp | Arg | Ile | Leu |
|    |     |     |     |     |     | 130 |     |     | 135 |     |     | 140 |     |     |     |     |
|    | Lys | Leu | Asn | Ser | Thr | Glu | Trp | Pro | Tyr | Phe | Val | Val | Gly | Ile | Phe | Cys |
|    |     |     |     |     |     | 145 |     | 150 |     |     | 155 |     |     |     |     | 160 |
|    | Ala | Ile | Ile | Asn | Gly | Gly | Leu | Gln | Pro | Ala | Phe | Ser | Ile | Ile | Phe | Ser |
|    |     |     |     |     |     | 165 |     |     | 170 |     |     | 175 |     |     |     |     |
| 35 | Arg | Ile | Ile | Gly | Ile | Phe | Thr | Arg | Asp | Glu | Asp | Pro | Glu | Thr | Lys | Arg |
|    |     |     |     |     |     | 180 |     |     | 185 |     |     | 190 |     |     |     |     |
|    | Gln | Ile | Ser | Asn | Met | Phe | Ser | Val | Leu | Phe | Leu | Val | Leu | Gly | Ile | Ile |
|    |     |     |     |     |     | 195 |     |     | 200 |     |     | 205 |     |     |     |     |
| 40 | Ser | Phe | Ile | Thr | Phe | Phe | Leu | Gln | Gly | Phe | Thr | Phe | Gly | Lys | Ala | Gly |
|    |     |     |     |     |     | 210 |     |     | 215 |     |     | 220 |     |     |     |     |
|    | Glu | Ile | Leu | Thr | Lys | Arg | Leu | Arg | Tyr | Met | Val | Phe | Arg | Ser | Met | Leu |
|    |     |     |     |     |     | 225 |     | 230 |     |     | 235 |     |     |     |     | 240 |
|    | Arg | Gln | Asp | Val | Ser | Trp | Phe | Asp | Asp | Leu | Lys | Asn | Thr | Thr | Gly | Ala |
| 45 |     |     |     |     |     | 245 |     |     | 250 |     |     | 255 |     |     |     |     |
|    | Leu | Thr | Thr | Arg | Leu | Ala | Asn | Asp | Ala | Ala | Gln | Val | Lys | Gly | Ala | Ile |
|    |     |     |     |     |     | 260 |     |     | 265 |     |     | 270 |     |     |     |     |
|    | Gly | Ser | Arg | Leu | Ala | Val | Ile | Thr | Gln | Asn | Ile | Ala | Asn | Leu | Gly | Thr |
|    |     |     |     |     |     | 275 |     |     | 280 |     |     | 285 |     |     |     |     |
| 50 | Gly | Ile | Ile | Ile | Ser | Leu | Ile | Tyr | Gly | Trp | Gln | Leu | Thr | Leu | Leu | Leu |
|    |     |     |     |     |     | 290 |     |     | 295 |     |     | 300 |     |     |     |     |
|    | Leu | Ala | Ile | Val | Pro | Ile | Ile | Ala | Ile | Ala | Gly | Val | Val | Glu | Met | Lys |
|    |     |     |     |     |     | 305 |     | 310 |     |     | 315 |     |     |     |     | 320 |
|    | Met | Leu | Ser | Gly | Gln | Ala | Leu | Lys | Asp | Lys | Lys | Glu | Leu | Glu | Gly | Ala |
|    |     |     |     |     |     | 325 |     |     | 330 |     |     | 335 |     |     |     |     |
| 55 | Gly | Lys | Ile | Ala | Thr | Glu | Ala | Ile | Glu | Asn | Phe | Arg | Thr | Val | Val | Ser |
|    |     |     |     |     |     | 340 |     |     | 345 |     |     | 350 |     |     |     |     |
|    | Leu | Thr | Gln | Glu | Gln | Lys | Phe | Glu | His | Met | Tyr | Ala | Gln | Ser | Leu | Gln |
|    |     |     |     |     |     | 355 |     |     | 360 |     |     | 365 |     |     |     |     |

60 <210> 7

&lt;211&gt; 1280

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

|    |   |
|----|---|
| 5  | <400> 7   |
|    | Met Asp Leu Glu Gly Asp Arg Asn Gly Gly Ala Lys Lys Lys Asn Phe |
|    | 1 5 10 15   |
|    | Phe Lys Leu Asn Asn Lys Ser Glu Lys Asp Lys Lys Glu Lys Lys Pro |
|    | 20 25 30  |
| 10 | Thr Val Ser Val Phe Ser Met Phe Arg Tyr Ser Asn Trp Leu Asp Lys |
|    | 35 40 45  |
|    | Leu Tyr Met Val Val Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly |
|    | 50 55 60  |
| 15 | Leu Pro Leu Met Met Leu Val Phe Gly Glu Met Thr Asp Ile Phe Ala |
|    | 65 70 75 80   |
|    | Asn Ala Gly Asn Leu Glu Asp Leu Met Ser Asn Ile Thr Asn Arg Ser |
|    | 85 90 95  |
|    | Asp Ile Asn Asp Thr Gly Phe Phe Met Asn Leu Glu Glu Asp Met Thr |
|    | 100 105 110   |
| 20 | Arg Tyr Ala Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu Val Ala     |
|    | 115 120 125   |
|    | Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln Ile |
|    | 130 135 140   |
|    | His Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln Glu Ile |
|    | 145 150 155 160   |
|    | Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg Leu Thr |
|    | 165 170 175   |
|    | Asp Asp Val Ser Lys Ile Asn Glu Val Ile Gly Asp Lys Ile Gly Met |
|    | 180 185 190   |
| 30 | Phe Phe Gln Ser Met Ala Thr Phe Phe Thr Gly Phe Ile Val Gly Phe |
|    | 195 200 205   |
|    | Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser Pro Val |
|    | 210 215 220   |
|    | Leu Gly Leu Ser Ala Ala Val Trp Ala Lys Ile Leu Ser Ser Phe Thr |
|    | 225 230 235 240   |
|    | Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu Glu |
|    | 245 250 255   |
|    | Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln Lys Lys |
|    | 260 265 270   |
| 40 | Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile Gly |
|    | 275 280 285   |
|    | Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe Leu |
|    | 290 295 300   |
|    | Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Thr Leu |
|    | 305 310 315 320   |
|    | Val Leu Ser Gly Glu Tyr Ser Ile Gly Gln Val Leu Thr Val Phe Phe |
|    | 325 330 335   |
|    | Ser Val Leu Ile Gly Ala Phe Ser Val Gly Gln Ala Ser Pro Ser Ile |
|    | 340 345 350   |
| 50 | Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe Lys Ile |
|    | 355 360 365   |
|    | Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly His Lys |
|    | 370 375 380   |
|    | Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Arg Asn Val His Phe Ser |
|    | 385 390 395 400   |
|    | Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn Leu Lys |
|    | 405 410 415   |
|    | Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly Cys Gly |
|    | 420 425 430   |
| 60 | Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro Thr Glu |

|    |   |     |     |
|----|---|-----|-----|
|    | 435   | 440 | 445 |
|    | Gly Met Val Ser Val Asp Gly Gln Asp Ile Arg Thr Ile Asn Val Arg |     |     |
|    | 450   | 455 | 460 |
| 5  | Phe Leu Arg Glu Ile Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe |     |     |
|    | 465   | 470 | 475 |
|    | Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn Val Thr |     |     |
|    | 485   | 490 | 495 |
|    | Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr Asp Phe |     |     |
| 10 | 500   | 505 | 510 |
|    | Ile Met Lys Leu Pro His Lys Phe Asp Thr Leu Val Gly Glu Arg Gly |     |     |
|    | 515   | 520 | 525 |
|    | Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala |     |     |
|    | 530   | 535 | 540 |
|    | Leu Val Arg Asn Pro Lys Ile Leu Leu Asp Glu Ala Thr Ser Ala     |     |     |
| 15 | 545   | 550 | 555 |
|    | Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp Lys Ala |     |     |
|    | 565   | 570 | 575 |
|    | Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser Thr Val |     |     |
|    | 580   | 585 | 590 |
| 20 | Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile Val Glu |     |     |
|    | 595   | 600 | 605 |
|    | Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe Lys |     |     |
|    | 610   | 615 | 620 |
| 25 | Leu Val Thr Met Gln Thr Ala Gly Asn Glu Val Glu Leu Glu Asn Ala |     |     |
|    | 625   | 630 | 635 |
|    | Ala Asp Glu Ser Lys Ser Glu Ile Asp Ala Leu Glu Met Ser Ser Asn |     |     |
|    | 645   | 650 | 655 |
|    | Asp Ser Arg Ser Ser Leu Ile Arg Lys Arg Ser Thr Arg Arg Ser Val |     |     |
| 30 | 660   | 665 | 670 |
|    | Arg Gly Ser Gln Ala Gln Asp Arg Lys Leu Ser Thr Lys Glu Ala Leu |     |     |
|    | 675   | 680 | 685 |
|    | Asp Glu Ser Ile Pro Pro Val Ser Phe Trp Arg Ile Met Lys Leu Asn |     |     |
|    | 690   | 695 | 700 |
| 35 | Leu Thr Glu Trp Pro Tyr Phe Val Val Gly Val Phe Cys Ala Ile Ile |     |     |
|    | 705   | 710 | 715 |
|    | Asn Gly Gly Leu Gln Pro Ala Phe Ala Ile Ile Phe Ser Lys Ile Ile |     |     |
|    | 725   | 730 | 735 |
|    | Gly Val Phe Thr Arg Ile Asp Asp Pro Glu Thr Lys Arg Gln Asn Ser |     |     |
|    | 740   | 745 | 750 |
| 40 | Asn Leu Phe Ser Leu Leu Phe Leu Ala Leu Gly Ile Ile Ser Phe Ile |     |     |
|    | 755   | 760 | 765 |
|    | Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile Leu |     |     |
|    | 770   | 775 | 780 |
| 45 | Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln Asp |     |     |
|    | 785   | 790 | 795 |
|    | Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr Thr |     |     |
|    | 805   | 810 | 815 |
|    | Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser Arg |     |     |
| 50 | 820   | 825 | 830 |
|    | Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile Ile |     |     |
|    | 835   | 840 | 845 |
|    | Ile Ser Phe Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Ala Ile     |     |     |
|    | 850   | 855 | 860 |
| 55 | Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu Ser |     |     |
|    | 865   | 870 | 875 |
|    | Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys Ile |     |     |
|    | 885   | 890 | 895 |
|    | Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr Gln |     |     |
|    | 900   | 905 | 910 |
| 60 | Glu Gln Lys Phe Glu His Met Tyr Ala Gln Ser Leu Gln Val Pro Tyr |     |     |

|    |   |      |      |
|----|---|------|------|
|    | 915   | 920  | 925  |
|    | Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Ile Thr Phe Ser Phe |      |      |
|    | 930   | 935  | 940  |
| 5  | Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe Gly |      |      |
|    | 945   | 950  | 955  |
|    | Ala Tyr Leu Val Ala His Lys Leu Met Ser Phe Glu Asp Val Leu Leu |      | 960  |
|    | 965   | 970  | 975  |
|    | Val Phe Ser Ala Val Val Phe Gly Ala Met Ala Val Gly Gln Val Ser |      |      |
| 10 | 980   | 985  | 990  |
|    | Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Ile Ser Ala Ala His Ile |      |      |
|    | 995   | 1000 | 1005 |
|    | Ile Met Ile Ile Glu Lys Thr Pro Leu Ile Asp Ser Tyr Ser Thr Glu |      |      |
|    | 1010  | 1015 | 1020 |
| 15 | Gly Leu Met Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Gly Glu Val |      |      |
|    | 1025  | 1030 | 1035 |
|    | Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln Gly Leu |      | 1040 |
|    | 1045  | 1050 | 1055 |
|    | Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly Ser Ser |      |      |
|    | 1060  | 1065 | 1070 |
| 20 | Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe Tyr Asp |      |      |
|    | 1075  | 1080 | 1085 |
|    | Pro Leu Ala Gly Lys Val Leu Leu Asp Gly Lys Glu Ile Lys Arg Leu |      |      |
|    | 1090  | 1095 | 1100 |
| 25 | Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln Glu Pro |      |      |
|    | 1105  | 1110 | 1115 |
|    | Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly Asp Asn |      | 1120 |
|    | 1125  | 1130 | 1135 |
|    | Ser Arg Val Val Ser Gln Glu Glu Ile Val Arg Ala Ala Lys Glu Ala |      |      |
|    | 1140  | 1145 | 1150 |
| 30 | Asn Ile His Ala Phe Ile Glu Ser Leu Pro Asn Lys Tyr Ser Thr Lys |      |      |
|    | 1155  | 1160 | 1165 |
|    | Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile |      |      |
|    | 1170  | 1175 | 1180 |
| 35 | Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu Leu Asp |      |      |
|    | 1185  | 1190 | 1195 |
|    | Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln Glu |      | 1200 |
|    | 1205  | 1210 | 1215 |
|    | Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile Ala His |      |      |
|    | 1220  | 1225 | 1230 |
| 40 | Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe Gln Asn |      |      |
|    | 1235  | 1240 | 1245 |
|    | Gly Arg Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala Gln Lys |      |      |
|    | 1250  | 1255 | 1260 |
| 45 | Gly Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Thr Lys Arg Gln |      |      |
|    | 1265  | 1270 | 1275 |
|    |   |      | 1280 |
|    | <210> 8   |      |      |
|    | <211> 1279  |      |      |
|    | <212> PRT   |      |      |
| 50 | <213> Homo sapiens  |      |      |
|    | <400> 8   |      |      |
|    | Met Asp Leu Glu Gly Asp Arg Asn Gly Gly Ala Lys Lys Lys Asn Phe |      |      |
|    | 1   | 5    | 10   |
| 55 | Phe Lys Leu Asn Asn Lys Ser Glu Lys Asp Lys Lys Glu Lys Lys Pro |      | 15   |
|    | 20  | 25   | 30   |
|    | Thr Val Ser Val Phe Ser Met Phe Arg Tyr Ser Asn Trp Leu Asp Lys |      |      |
|    | 35  | 40   | 45   |
| 60 | Leu Tyr Met Val Val Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly |      |      |
|    | 50  | 55   | 60   |

|    |                         |   |     |
|----|-------------------------|---|-----|
|    | Leu Pro Leu Met Met     | Leu Val Phe Gly Glu Met Thr Asp Ile Phe Ala     |     |
| 65 | 70                      | 75  | 80  |
|    | Asn Ala Gly Asn         | Leu Glu Asp Leu Met Ser Asn Ile Thr Asn Arg Ser |     |
|    | 85                      | 90  | 95  |
| 5  | Asp Ile Asn Asp         | Thr Gly Phe Phe Met Asn Leu Glu Glu Asp Met Thr |     |
|    | 100                     | 105   | 110 |
|    | Arg Tyr Ala Tyr Tyr Tyr | Ser Gly Ile Gly Ala Gly Val Leu Val Ala         |     |
|    | 115                     | 120   | 125 |
| 10 | Ala Tyr Ile Gln Val Ser | Phe Trp Cys Leu Ala Ala Gly Arg Gln Ile         |     |
|    | 130                     | 135   | 140 |
|    | His Lys Ile Arg Lys     | Gln Phe Phe His Ala Ile Met Arg Gln Glu Ile     |     |
|    | 145                     | 150   | 155 |
|    | Gly Trp Phe Asp Val     | His Asp Val Gly Glu Leu Asn Thr Arg Leu Thr     |     |
|    | 165                     | 170   | 175 |
| 15 | Asp Asp Val Ser Lys     | Ile Asn Glu Gly Ile Gly Asp Lys Ile Gly Met     |     |
|    | 180                     | 185   | 190 |
|    | Phe Phe Gln Ser Met     | Ala Thr Phe Phe Thr Gly Phe Ile Val Gly Phe     |     |
|    | 195                     | 200   | 205 |
| 20 | Thr Arg Gly Trp Lys     | Leu Thr Leu Val Ile Leu Ala Ile Ser Pro Val     |     |
|    | 210                     | 215   | 220 |
|    | Leu Gly Leu Ser Ala     | Ala Val Trp Ala Lys Ile Leu Ser Ser Phe Thr     |     |
|    | 225                     | 230   | 235 |
|    | Asp Lys Glu Leu Leu     | Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu Glu     |     |
|    | 245                     | 250   | 255 |
| 25 | Val Leu Ala Ala Ile     | Arg Thr Val Ile Ala Phe Gly Gly Gln Lys Lys     |     |
|    | 260                     | 265   | 270 |
|    | Glu Leu Glu Arg Tyr     | Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile Gly     |     |
|    | 275                     | 280   | 285 |
| 30 | Ile Lys Lys Ala Ile     | Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe Leu     |     |
|    | 290                     | 295   | 300 |
|    | Leu Ile Tyr Ala Ser     | Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Thr Leu     |     |
|    | 305                     | 310   | 315 |
|    | Val Leu Ser Gly Glu     | Tyr Ser Ile Gly Gln Val Leu Thr Val Phe Ser     |     |
|    | 325                     | 330   | 335 |
| 35 | Val Leu Ile Gly Ala     | Phe Ser Val Gly Gln Ala Ser Pro Ser Ile Glu     |     |
|    | 340                     | 345   | 350 |
|    | Ala Phe Ala Asn Ala     | Arg Gly Ala Ala Tyr Glu Ile Phe Lys Ile Ile     |     |
|    | 355                     | 360   | 365 |
| 40 | Asp Asn Lys Pro Ser     | Ile Asp Ser Tyr Ser Lys Ser Gly His Lys Pro     |     |
|    | 370                     | 375   | 380 |
|    | Asp Asn Ile Lys Gly     | Asn Leu Glu Phe Arg Asn Val His Phe Ser Tyr     |     |
|    | 385                     | 390   | 395 |
|    | Pro Ser Arg Lys Glu     | Val Lys Ile Leu Lys Gly Leu Asn Leu Lys Val     |     |
|    | 405                     | 410   | 415 |
| 45 | Gln Ser Gly Gln Thr     | Val Ala Leu Val Gly Asn Ser Gly Cys Gly Lys     |     |
|    | 420                     | 425   | 430 |
|    | Ser Thr Thr Val Gln     | Leu Met Gln Arg Leu Tyr Asp Pro Thr Glu Gly     |     |
|    | 435                     | 440   | 445 |
| 50 | Met Val Ser Val Asp     | Gly Gln Asp Ile Arg Thr Ile Asn Val Arg Phe     |     |
|    | 450                     | 455   | 460 |
|    | Leu Arg Glu Ile Ile     | Gly Val Val Ser Gln Glu Pro Val Leu Phe Ala     |     |
|    | 465                     | 470   | 475 |
|    | Thr Thr Ile Ala Glu     | Asn Ile Arg Tyr Gly Arg Glu Asn Val Thr Met     |     |
|    | 485                     | 490   | 495 |
| 55 | Asp Glu Ile Glu Lys     | Ala Val Lys Glu Ala Asn Ala Tyr Asp Phe Ile     |     |
|    | 500                     | 505   | 510 |
|    | Met Lys Leu Pro His     | Lys Phe Asp Thr Leu Val Gly Glu Arg Gly Ala     |     |
|    | 515                     | 520   | 525 |
| 60 | Gln Leu Ser Gly Gly     | Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu     |     |
|    | 530                     | 535   | 540 |

|     |   |      |      |
|-----|---|------|------|
|     | Val Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu |      |      |
| 545 | 550   | 555  | 560  |
|     | Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp Lys Ala Arg |      |      |
|     | 565   | 570  | 575  |
| 5   | Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser Thr Val Arg |      |      |
|     | 580   | 585  | 590  |
|     | Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile Val Glu Lys |      |      |
|     | 595   | 600  | 605  |
| 10  | Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe Lys Leu |      |      |
|     | 610   | 615  | 620  |
|     | Val Thr Met Gln Thr Ala Gly Asn Glu Val Glu Leu Glu Asn Ala Ala |      |      |
| 625 | 630   | 635  | 640  |
|     | Asp Glu Ser Lys Ser Glu Ile Asp Ala Leu Glu Met Ser Ser Asn Asp |      |      |
|     | 645   | 650  | 655  |
| 15  | Ser Arg Ser Ser Leu Ile Arg Lys Arg Ser Thr Arg Arg Ser Val Arg |      |      |
|     | 660   | 665  | 670  |
|     | Gly Ser Gln Ala Gln Asp Arg Lys Leu Ser Thr Lys Glu Ala Leu Asp |      |      |
|     | 675   | 680  | 685  |
| 20  | Glu Ser Ile Pro Pro Val Ser Phe Trp Arg Ile Met Lys Leu Asn Leu |      |      |
|     | 690   | 695  | 700  |
|     | Thr Glu Trp Pro Tyr Phe Val Val Gly Val Phe Cys Ala Ile Ile Asn |      |      |
| 705 | 710   | 715  | 720  |
|     | Gly Gly Leu Gln Pro Ala Phe Ala Ile Ile Phe Ser Lys Ile Ile Gly |      |      |
|     | 725   | 730  | 735  |
| 25  | Val Phe Thr Arg Ile Asp Asp Pro Glu Thr Lys Arg Gln Asn Ser Asn |      |      |
|     | 740   | 745  | 750  |
|     | Leu Phe Ser Leu Leu Phe Leu Ala Leu Gly Ile Ile Ser Phe Ile Thr |      |      |
|     | 755   | 760  | 765  |
| 30  | Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile Leu Thr |      |      |
|     | 770   | 775  | 780  |
|     | Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln Asp Val |      |      |
| 785 | 790   | 795  | 800  |
|     | Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr Thr Arg |      |      |
|     | 805   | 810  | 815  |
| 35  | Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser Arg Leu |      |      |
|     | 820   | 825  | 830  |
|     | Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile Ile Ile |      |      |
|     | 835   | 840  | 845  |
| 40  | Ser Phe Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Ala Ile Val     |      |      |
|     | 850   | 855  | 860  |
|     | Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu Ser Gly |      |      |
| 865 | 870   | 875  | 880  |
|     | Gln Ala Leu Lys Asp Lys Glu Leu Glu Gly Ala Gly Lys Ile Ala     |      |      |
|     | 885   | 890  | 895  |
| 45  | Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr Gln Glu |      |      |
|     | 900   | 905  | 910  |
|     | Gln Lys Phe Glu His Met Tyr Ala Gln Ser Leu Gln Val Pro Tyr Arg |      |      |
|     | 915   | 920  | 925  |
| 50  | Asn Ser Leu Arg Lys Ala His Ile Phe Gly Ile Thr Phe Ser Phe Thr |      |      |
|     | 930   | 935  | 940  |
|     | Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe Gly Ala |      |      |
| 945 | 950   | 955  | 960  |
|     | Tyr Leu Val Ala His Lys Leu Met Ser Phe Glu Asp Val Leu Leu Val |      |      |
|     | 965   | 970  | 975  |
| 55  | Phe Ser Ala Val Val Phe Gly Ala Met Ala Val Gly Gln Val Ser Ser |      |      |
|     | 980   | 985  | 990  |
|     | Phe Ala Pro Asp Tyr Ala Lys Ala Lys Ile Ser Ala Ala His Ile Ile |      |      |
|     | 995   | 1000 | 1005 |
| 60  | Met Ile Ile Glu Lys Thr Pro Leu Ile Asp Ser Tyr Ser Thr Glu Gly |      |      |
|     | 1010  | 1015 | 1020 |

Leu Met Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Gly Glu Val Val  
 1025 1030 1035 1040  
 Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln Gly Leu Ser  
 1045 1050 1055  
 5 Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly Ser Ser Gly  
 1060 1065 1070  
 Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe Tyr Asp Pro  
 1075 1080 1085  
 Leu Ala Gly Lys Val Leu Leu Asp Gly Lys Glu Ile Lys Arg Leu Asn  
 1090 1095 1100  
 Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln Glu Pro Ile  
 1105 1110 1115 1120  
 10 Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly Asp Asn Ser  
 1125 1130 1135  
 15 Arg Val Val Ser Gln Glu Glu Ile Val Arg Ala Ala Lys Glu Ala Asn  
 1140 1145 1150  
 Ile His Ala Phe Ile Glu Ser Leu Pro Asn Lys Tyr Ser Thr Lys Val  
 1155 1160 1165  
 Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala  
 20 1170 1175 1180  
 Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu Leu Asp Glu  
 1185 1190 1195 1200  
 Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln Glu Ala  
 1205 1210 1215  
 25 Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile Ala His Arg  
 1220 1225 1230  
 Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe Gln Asn Gly  
 1235 1240 1245  
 30 Arg Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala Gln Lys Gly  
 1250 1255 1260  
 Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Thr Lys Arg Gln  
 1265 1270 1275

35 <210> 9  
 <211> 24  
 <212> DNA  
 <213> Homo sapiens

40 <400> 9  
 gaactgtgat tgcgtttgga ggac

45 <210> 10  
 <211> 22  
 <212> DNA  
 <213> Canis familiaris

<400> 10  
 ttcagggccg cctgtacctc tg

50 <210> 11  
 <211> 22  
 <212> DNA  
 <213> Canis familiaris

55 <400> 11  
 cccccacagat ggcattgtct gt

60 <210> 12  
 <211> 23  
 <212> DNA

24

22

22

|    |   |    |
|----|---|----|
|    | <213> Homo sapiens                                |    |
|    | <400> 12  |    |
| 5  | cgcttggta gatatctctcc agc                         | 23 |
|    | <210> 13  |    |
|    | <211> 24  |    |
|    | <212> DNA   |    |
| 10 | <213> Canis familiaris                            |    |
|    | <400> 13  |    |
|    | agaaacagag aatcgccatt gctc                        | 24 |
|    | <210> 14  |    |
| 15 | <211> 23  |    |
|    | <212> DNA   |    |
|    | <213> Homo sapiens                                |    |
|    | <400> 14  |    |
| 20 | gctgcagtca aacaggatgg gct                         | 23 |
|    | <210> 15  |    |
|    | <211> 24  |    |
| 25 | <212> DNA   |    |
|    | <213> Canis familiaris                            |    |
|    | <400> 15  |    |
|    | agttcatttg ctcctgacta tgcc                        | 24 |
| 30 | <210> 16  |    |
|    | <211> 22  |    |
|    | <212> DNA   |    |
|    | <213> Homo sapiens                                |    |
| 35 | <400> 16  |    |
|    | gatgccttc tgggccagca gc                           | 22 |
|    | <210> 17  |    |
|    | <211> 30  |    |
| 40 | <212> DNA   |    |
|    | <213> Canis familiaris                            |    |
|    | <400> 17  |    |
|    | gaggtgaaga agggccagac gctggccctc                  | 30 |
| 45 | <210> 18  |    |
|    | <211> 45  |    |
|    | <212> DNA   |    |
|    | <213> Artificial Sequence                         |    |
| 50 | <220>   |    |
|    | <223> Synthetic oligonucleotide                   |    |
|    | <400> 18  |    |
| 55 | ctaatacgac tcactatagg gcaaggatgt gtaacaacgc agagt | 45 |
|    | <210> 19  |    |
|    | <211> 29  |    |
|    | <212> DNA   |    |
| 60 | <213> Canis familiaris                            |    |

|    |   |     |
|----|---|-----|
|    | <400> 19  |     |
|    | cgcagccact gttcccaacc agcgccact                                   | 29  |
| 5  | <210> 20  |     |
|    | <211> 23  |     |
|    | <212> DNA   |     |
|    | <213> Homo sapiens  |     |
| 10 | <400> 20  |     |
|    | ggagcgcgag gtcggatgg atc  | 23  |
|    | <210> 21  |     |
| 15 | <211> 31  |     |
|    | <212> DNA   |     |
|    | <213> Canis familiaris  |     |
|    | <400> 21  |     |
| 20 | ggagaggacc aaggaggtcc cataccagaa a                                | 31  |
|    | <210> 22  |     |
|    | <211> 4279  |     |
|    | <212> DNA   |     |
| 25 | <213> Canis familiaris  |     |
|    | <220>   |     |
|    | <221> CDS   |     |
|    | <222> (17) ... (3859)   |     |
| 30 | <400> 22  |     |
|    | ggagcgcgag gtcggg atg gat cct gaa gga ggc cgt aag ggg agt gca gag | 52  |
|    | Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu                   |     |
|    | 1 5 10  |     |
| 35 | aag aac ttc tgg aaa atg ggc aaa aaa agt aaa aaa aat gag aag aaa   |     |
|    | Lys Asn Phe Trp Lys Met Gly Lys Ser Lys Lys Asn Glu Lys Lys       | 100 |
|    | 15 20 25  |     |
| 40 | gaa aag aaa cca act gtc agc acg ttt gca atg ttt cgc tat tca aat   |     |
|    | Glu Lys Pro Thr Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn       | 148 |
|    | 30 35 40  |     |
| 45 | tgg ctt gat agg ttg tat atg ttg gtg ggg aca atg gct gcc atc atc   |     |
|    | Trp Leu Asp Arg Leu Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile   | 196 |
|    | 45 50 55 60   |     |
| 50 | cat gga gct gca ctc cct ctc atg atg ctg gtt ttt gga aac atg aca   |     |
|    | His Gly Ala Ala Leu Pro Leu Met Met Leu Val Phe Gly Asn Met Thr   | 244 |
|    | 65 70 75  |     |
|    | gat agc ttt gca aat gca gga att tca aga aac aaa act ttt cca gtt   |     |
|    | Asp Ser Phe Ala Asn Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val   | 292 |
|    | 80 85 90  |     |
| 55 | ata att aat gaa agt att acg aac aat aca caa cat ttc atc aac cat   |     |
|    | Ile Ile Asn Glu Ser Ile Thr Asn Asn Thr Gln His Phe Ile Asn His   | 340 |
|    | 95 100 105  |     |
| 60 | ctg gag gag gaa atg acc acg tat gcc tat tat tac agt ggg atc ggt   |     |
|    | Leu Glu Glu Glu Met Thr Thr Tyr Ala Tyr Tyr Ser Gly Ile Gly       | 388 |

|    | 110   | 115 | 120 |      |
|----|---|-----|-----|------|
| 5  | gct ggc gtg ctg gtg gct tac atc cag gtt tca ttc tgg tgc ctg<br>Ala Gly Val Leu Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu<br>125 130 135 140     |     |     | 436  |
|    | gca gca gga aga cag ata ctc aaa att aga aaa caa ttt ttt cat gct<br>Ala Ala Gly Arg Gln Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala<br>145 150 155     |     |     | 484  |
| 10 | atc atg cga cag gag att ggc tgg ttt gac gtg cat gac gtt ggg gag<br>Ile Met Arg Gln Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu<br>160 165 170     |     |     | 532  |
| 15 | ctt aac acc cgg ctc aca gac gat gtc tcc aaa atc aat gaa gga att<br>Leu Asn Thr Arg Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile<br>175 180 185     |     |     | 580  |
| 20 | ggc gac aaa att gga atg ttc ttt caa tca ata gca aca ttt ttc acc<br>Gly Asp Lys Ile Gly Met Phe Phe Gln Ser Ile Ala Thr Phe Phe Thr<br>190 195 200     |     |     | 628  |
| 25 | ggt ttt ata gtg ggg ttt aca cgt ggt tgg aag cta acc ctt gtg att<br>Gly Phe Ile Val Gly Phe Thr Arg Gly Trp Lys Leu Thr Leu Val Ile<br>205 210 215 220 |     |     | 676  |
|    | ttg gcc atc agc cct gtt ctt gga ctt tca gcc gcc atc tgg gca aag<br>Leu Ala Ile Ser Pro Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys<br>225 230 235     |     |     | 724  |
| 30 | ata cta tct tca ttt act gat aaa gaa ctc ttg gcc tat gca aaa gct<br>Ile Leu Ser Ser Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala<br>240 245 250     |     |     | 772  |
| 35 | gga gca gta gct gaa gaa gtc tta gca gca atc aga act gtg att gcc<br>Gly Ala Val Ala Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala<br>255 260 265     |     |     | 820  |
| 40 | ttt gga gga caa aag aaa gaa ctt gaa agg tac aac aaa aat tta gaa<br>Phe Gly Gly Gln Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu<br>270 275 280     |     |     | 868  |
|    | gaa gct aaa gga att ggg ata aag aaa gct atc acg gcc aac att tct<br>Glu Ala Lys Gly Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser                    |     |     | 916  |
| 45 | 285 290 295 300   |     |     |      |
|    | att ggt gcc gct ttc tta ttg atc tat gca tca tat gct ctg gct ttc<br>Ile Gly Ala Ala Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe<br>305 310 315     |     |     | 964  |
| 50 | tgg tat ggg acc tcc ttg gtc ctc tcc agt gaa tat tct att gga caa<br>Trp Tyr Gly Thr Ser Leu Val Leu Ser Ser Glu Tyr Ser Ile Gly Gln<br>320 325 330     |     |     | 1012 |
| 55 | gta ctc act gtc ttc ttt tct gta tta att ggg gct ttt agt att gga<br>Val Leu Thr Val Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly<br>335 340 345     |     |     | 1060 |
| 60 | cag gca tcc cca agc att gaa gca ttt gca aac gca aga gga gca gct<br>Gln Ala Ser Pro Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala                    |     |     | 1108 |

|    | 350   | 355 | 360 |      |
|----|---|-----|-----|------|
| 5  | tat gaa atc ttc aag ata att gac aat aaa cca agc att gac agc tat<br>Tyr Glu Ile Phe Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr<br>365 370 375 380 |     |     | 1156 |
| 10 | tcg aag agt gga cat aaa cca gat aat att aag gga aat ttg gaa ttc<br>Ser Lys Ser Gly His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe<br>385 390 395     |     |     | 1204 |
| 15 | aaa aat gtt cac ttc agt tac cct tct cga aaa gaa gtt aag atc tta<br>Lys Asn Val His Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu<br>400 405 410     |     |     | 1252 |
| 20 | aag ggt ctc aac ctg aag gtt cag agt ggg cag aca gtg gcg ctg gtt<br>Lys Gly Leu Asn Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val<br>415 420 425     |     |     | 1300 |
| 25 | ggg aac agt ggc tgc ggg aag agc acg acc gtg cag ctg atg cag agg<br>Gly Asn Ser Gly Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg<br>430 435 440     |     |     | 1348 |
| 30 | ctc tat gac ccc aca gat ggc atg gtc tgt att gat gga cag gac att<br>Leu Tyr Asp Pro Thr Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile<br>445 450 455 460 |     |     | 1396 |
| 35 | agg acc ata aat gta agg cat ctt cgg gaa att act ggt gtg gtg agt<br>Arg Thr Ile Asn Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser<br>465 470 475     |     |     | 1444 |
| 40 | cag gag cct gtg ttg ttt gcc acc acg ata gct gaa aac att cgc tat<br>Gln Glu Pro Val Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr<br>480 485 490     |     |     | 1492 |
| 45 | ggc cgc gaa aat gtc acc atg gat gag att gag aaa gct gtt aag gaa<br>Gly Arg Glu Asn Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu<br>495 500 505     |     |     | 1540 |
| 50 | gcc aat gcc tat gat ttt atc atg aaa cta cct aat aaa ttt gac act<br>Ala Asn Ala Tyr Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr<br>510 515 520     |     |     | 1588 |
| 55 | ctg gtt gga gag aga ggg gcc cag ctg agt ggt gga cag aaa cag aga<br>Leu Val Gly Glu Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg<br>525 530 535 540 |     |     | 1636 |
| 60 | atc gcc att gct cgg gcc ctg gtt cgc aac ccc aag att ctt ctg ctg<br>Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Leu<br>545 550 555     |     |     | 1684 |
| 65 | gat gag gca acg tca gct ctg gac act gaa agt gaa gca gtg gtt cag<br>Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln<br>560 565 570     |     |     | 1732 |
| 70 | gtg gcc ctg gat aag gcc aga aaa ggc cgg act acc att gtg ata gct<br>Val Ala Leu Asp Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala<br>575 580 585     |     |     | 1780 |
| 75 | cat cgt ttg tct aca gtt cgt aat gcc gat gtc att gct ggt ttt gat<br>His Arg Leu Ser Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp                    |     |     | 1828 |

|    |   |     |     |      |
|----|---|-----|-----|------|
|    | 590   | 595 | 600 |      |
| 5  | gat gga gtc att gtg gag aaa gga aat cat gat gaa ctc atg aaa gag<br>Asp Gly Val Ile Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu<br>605 610 615 620 |     |     | 1876 |
| 10 | aag ggc att tac ttc aaa ctt gtc aca atg cag aca aga gga aat gaa<br>Lys Gly Ile Tyr Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu<br>625 630 635     |     |     | 1924 |
| 15 | att gag tta gaa aat gcc act ggt gaa tcc aaa agt gaa agt gat gcc<br>Ile Glu Leu Glu Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala<br>640 645 650     |     |     | 1972 |
| 20 | ttg gaa atg tct cca aaa gat tca ggg tcc agt tta ata aaa aga aga<br>Leu Glu Met Ser Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg<br>655 660 665     |     |     | 2020 |
| 25 | tca act cgc agg agt ata cat gca cca caa ggc caa gac aga aag ctt<br>Ser Thr Arg Arg Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu<br>670 675 680     |     |     | 2068 |
| 30 | ggt aca aaa gag gac ttg aat gag aat gta cct cca gtt tcc ttc tgg<br>Gly Thr Lys Glu Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp<br>685 690 695 700 |     |     | 2116 |
| 35 | agg att ctg aag ctg aac tca act gaa tgg cct tat ttt gtg gtt ggt<br>Arg Ile Leu Lys Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly<br>705 710 715     |     |     | 2164 |
| 40 | ata ttt tgt gct att ata aac gga ggc ctg caa cca gca ttt tca ata<br>Ile Phe Cys Ala Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile<br>720 725 730         |     |     | 2212 |
| 45 | ata ttt tca agg att ata ggg atc ttt acc cga gat gag gat cct gaa<br>Ile Phe Ser Arg Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu<br>735 740 745     |     |     | 2260 |
| 50 | aca aaa cga cag aat agt aac atg ttt tct gta ttg ttt cta gtc ctt<br>Thr Lys Arg Gln Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu<br>750 755 760     |     |     | 2308 |
| 55 | gga att att tct ttt att aca ttt ttc ctc cag ggc ttc aca ttt ggc<br>Gly Ile Ile Ser Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly<br>765 770 775 780 |     |     | 2356 |
| 60 | aaa gct ggg gag atc ctc act aag cgg ctt cga tac atg gtt ttc aga<br>Lys Ala Gly Glu Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg<br>785 790 795     |     |     | 2404 |
|    | tcc atg ctg aga cag gat gtc agc tgg ttt gat gac cct aaa aac acc<br>Ser Met Leu Arg Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr<br>800 805 810     |     |     | 2452 |
|    | act gga gca ttg aca acc agg ctt gcc aat gat gcg gct caa gtt aaa<br>Thr Gly Ala Leu Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys<br>815 820 825     |     |     | 2500 |
|    | ggg gct ata ggt tcc agg ctt gct gtc att acc cag aat ata gca aat<br>Gly Ala Ile Gly Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn                    |     |     | 2548 |

|    | 830   | 835 | 840 |      |
|----|---|-----|-----|------|
| 5  | ctt ggg aca ggc att att ata tcc tta atc tat ggt tgg caa tta aca<br>Leu Gly Thr Gly Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr<br>845 850 855 860         |     |     | 2596 |
| 10 | ctt tta ctc tta gca att gta ccc atc att gca ata gca gga gtt gtt<br>Leu Leu Leu Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val<br>865 870 875             |     |     | 2644 |
| 15 | gaa atg aaa atg ttg tct gga caa gca ctg aaa gat aag aaa gag cta<br>Glu Met Lys Met Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu<br>880 885 890         |     |     | 2692 |
| 20 | gaa gga gct ggg aag att gct aca gaa gcc atc gaa aac ttc cga act<br>Glu Gly Ala Gly Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr<br>895 900 905         |     |     | 2740 |
| 25 | gtt gtt tct ttg act cgg gag cag aag ttt gaa tac atg tat gca cag<br>Val Val Ser Leu Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln<br>910 915 920         |     |     | 2788 |
| 30 | agt ttg caa gta cca tac aga aac tct ttg agg aaa gca cac atc ttc<br>Ser Leu Gln Val Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe<br>925 930 935 940     |     |     | 2836 |
| 35 | ggg gtc tca ttt tct atc acc cag gca atg atg tat ttt tcc tat gct<br>Gly Val Ser Phe Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala<br>945 950 955         |     |     | 2884 |
| 40 | ggc tgt ttc cgg ttt ggt gcc tac ttg gtg gca aat gag ttc atg aac<br>Gly Cys Phe Arg Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn<br>960 965 970         |     |     | 2932 |
| 45 | ttt cag gat gtt ctt ttg gta ttc tca gct att gtc ttt ggt gcc atg<br>Phe Gln Asp Val Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met<br>975 980 985         |     |     | 2980 |
| 50 | gca gtg ggg cag gtc agt tca ttt gct cct gac tat gcc aaa gcc aaa<br>Ala Val Gly Gln Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys<br>990 995 1000        |     |     | 3028 |
| 55 | gta tca gca gcc cac gtc atc atg atc att gaa aaa agc cct ctg att<br>Val Ser Ala Ala His Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile<br>1005 1010 1015 1020 |     |     | 3076 |
| 60 | gac agc tac agc cct cac ggc ctc aag cca aat acg ttg gaa gga aat<br>Asp Ser Tyr Ser Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn<br>1025 1030 1035      |     |     | 3124 |
|    | gtg aca ttt aat gag gtc gtg ttc aac tat ccc act cga cca gac atc<br>Val Thr Phe Asn Glu Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile<br>1040 1045 1050      |     |     | 3172 |
|    | ccc gtg ctc cag ggg ctg agc ctc gag gtg aag aag ggc cag acg ctg<br>Pro Val Leu Gln Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu<br>1055 1060 1065      |     |     | 3220 |
|    | gcc ctc gta ggt agc agt ggc tgt ggg aag agc aca gtt gtt cag ctc<br>Ala Leu Val Gly Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu                        |     |     | 3268 |

|    | 1070   | 1075 | 1080 |      |
|----|--|------|------|------|
| 5  | cta gag cgc ttc tat gac ccc ttg gct ggt tca gtg cta att gat ggc<br>Leu Glu Arg Phe Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly<br>1085 1090 1095 1100  |      |      | 3316 |
| 10 | aaa gag ata aag cac ctg aat gtc cag tgg ctc cga gca cac ctg ggc<br>Lys Glu Ile Lys His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly<br>1105 1110 1115   |      |      | 3364 |
| 15 | atc gtg tct cag gag ccc atc ctg ttt gac tgc agc att gcc gag aac<br>Ile Val Ser Gln Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn<br>1120 1125 1130   |      |      | 3412 |
| 20 | att gcc tat gga gac aac agc cggtt gtc gta tca cat gaa gag att atg<br>Ile Ala Tyr Gly Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Met<br>1135 1140 1145   |      |      | 3460 |
| 25 | cag gca gcc aag gag gcc aac ata cac cac ttc atc gag aca ctc cct<br>Gln Ala Ala Lys Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro<br>1150 1155 1160   |      |      | 3508 |
| 30 | gag aaa tac aac acc aga gta gga gac aaa gga acc cag ctc tct ggt<br>Glu Lys Tyr Asn Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly<br>1165 1170 1175 1180  |      |      | 3556 |
| 35 | ggc cag aaa cag cgc att gcc ata gct cgc gct ctt gtt aga cag cct<br>Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro<br>1185 1190 1195   |      |      | 3604 |
| 40 | cat att ttg ctt ttg gat gaa gct aca tca gct ctg gat aca gaa agt<br>His Ile Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser<br>1200 1205 1210   |      |      | 3652 |
| 45 | gaa aag gtt gtc caa gaa gcc ctg gac aaa gcc aga gaa ggc cgc acc<br>Glu Lys Val Val Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr<br>1215 1220 1225   |      |      | 3700 |
| 50 | tgc att gtg atc gcc cac cgc ttg tcc acc atc cag aat gca gat tta<br>Cys Ile Val Ile Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu<br>1230 1235 1240   |      |      | 3748 |
| 55 | ata gtg gtg ttt cag aat ggc aaa gtc aag gag cat ggc aca cat caa<br>Ile Val Val Phe Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln<br>1245 1250 1255 1260  |      |      | 3796 |
| 60 | cag ctg ctg gcc cag aaa ggc atc tat ttt tcc atg gtc agt gtc cag<br>Gln Leu Leu Ala Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln<br>1265 1270 1275   |      |      | 3844 |
| 65 | gct gga gca aag cgc tagtgaactg tggccatatg agctgttaaa tattttttaa<br>Ala Gly Ala Lys Arg<br>1280   |      |      | 3899 |
| 70 | tatgtgtttt aaaaatggc atttatcaa agttaaaagg tgagcactta ctggaaaaac<br>tatgtagaac tacctgttta acatttcttg ctgcaactga agatcattcc accaagtgttca<br>gagtcttcag attttataat taaaggaacc aaaagaaaca ttatctgtatg gaataaaaata<br>ctgggtttaa ttgcattata aaattataga gtaattcaaa gtagatttt gtaataaaatt<br>gtataatttt tgtttatatt ttatgtttaa cttactgctt tgctgaaaga ttatagaagt<br>gtaaaaagt actgaatgtt tgaataaaagt gctagctata ataaaaactaa acttttatat<br>1285 1290 1295 1300 |      |      | 3959 |

aaaaaaaaaa aaaaaaaaaa

|    |   |      |
|----|---|------|
|    | <210>   | 23   |
| 5  | <211>   | 1281 |
|    | <212>   | PRT  |
|    | <213> Canis familiaris  |      |
|    | <400> 23  |      |
| 10 | Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu Lys Asn Phe Trp |      |
|    | 1   | 5    |
|    |   | 10   |
|    |   | 15   |
|    | Lys Met Gly Lys Lys Ser Lys Lys Asn Glu Lys Lys Glu Lys Lys Pro |      |
|    | 20  | 25   |
|    |   | 30   |
|    | Thr Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn Trp Leu Asp Arg |      |
|    | 35  | 40   |
|    |   | 45   |
| 15 | Leu Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile His Gly Ala Ala |      |
|    | 50  | 55   |
|    |   | 60   |
|    | Leu Pro Leu Met Met Leu Val Phe Gly Asn Met Thr Asp Ser Phe Ala |      |
|    | 65  | 70   |
|    |   | 75   |
|    | Asn Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val Ile Ile Asn Glu |      |
| 20 | 85  | 90   |
|    |   | 95   |
|    | Ser Ile Thr Asn Asn Thr Gln His Phe Ile Asn His Leu Glu Glu     |      |
|    | 100   | 105  |
|    |   | 110  |
|    | Met Thr Thr Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu |      |
|    | 115   | 120  |
|    |   | 125  |
| 25 | Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg |      |
|    | 130   | 135  |
|    |   | 140  |
|    | Gln Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln |      |
|    | 145   | 150  |
|    |   | 155  |
|    | 160   |      |
|    | Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg |      |
| 30 | 165   | 170  |
|    |   | 175  |
|    | Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Ile |      |
|    | 180   | 185  |
|    |   | 190  |
|    | Gly Met Phe Phe Gln Ser Ile Ala Thr Phe Phe Thr Gly Phe Ile Val |      |
|    | 195   | 200  |
|    |   | 205  |
| 35 | Gly Phe Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser |      |
|    | 210   | 215  |
|    |   | 220  |
|    | Pro Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys Ile Leu Ser Ser |      |
|    | 225   | 230  |
|    |   | 235  |
|    | 240   |      |
|    | Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala |      |
| 40 | 245   | 250  |
|    |   | 255  |
|    | Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln |      |
|    | 260   | 265  |
|    |   | 270  |
|    | Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Gly |      |
|    | 275   | 280  |
|    |   | 285  |
| 45 | Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala |      |
|    | 290   | 295  |
|    |   | 300  |
|    | Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr |      |
|    | 305   | 310  |
|    |   | 315  |
|    | 320   |      |
|    | Ser Leu Val Leu Ser Ser Glu Tyr Ser Ile Gly Gln Val Leu Thr Val |      |
| 50 | 325   | 330  |
|    |   | 335  |
|    | Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly Gln Ala Ser Pro |      |
|    | 340   | 345  |
|    |   | 350  |
|    | Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe |      |
|    | 355   | 360  |
|    |   | 365  |
| 55 | Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly |      |
|    | 370   | 375  |
|    |   | 380  |
|    | His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Lys Asn Val His |      |
|    | 385   | 390  |
|    |   | 395  |
|    | 400   |      |
|    | Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn |      |
| 60 | 405   | 410  |
|    |   | 415  |

Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly  
     420                  425                  430  
 Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro  
     435                  440                  445  
 5     Thr Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile Arg Thr Ile Asn  
     450                  455                  460  
 Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser Gln Glu Pro Val  
     465                  470                  475                  480  
 Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn  
     485                  490                  495  
 10    Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr  
     500                  505                  510  
 Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr Leu Val Gly Glu  
     515                  520                  525  
 15    Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala  
     530                  535                  540  
 Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Asp Glu Ala Thr  
     545                  550                  555                  560  
 Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp  
     565                  570                  575  
 20    Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser  
     580                  585                  590  
 Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile  
     595                  600                  605  
 25    Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr  
     610                  615                  620  
 Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu Ile Glu Leu Glu  
     625                  630                  635                  640  
 30    Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met Ser  
     645                  650                  655  
 Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg Arg  
     660                  665                  670  
 Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys Glu  
     675                  680                  685  
 35    Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp Arg Ile Leu Lys  
     690                  695                  700  
 Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly Ile Phe Cys Ala  
     705                  710                  715                  720  
 Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser Arg  
     725                  730                  735  
 40    Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg Gln  
     740                  745                  750  
 Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile Ser  
     755                  760                  765  
 45    Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu  
     770                  775                  780  
 Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg  
     785                  790                  795                  800  
 Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu  
     805                  810                  815  
 50    Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly  
     820                  825                  830  
 Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly  
     835                  840                  845  
 55    Ile Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu  
     850                  855                  860  
 Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met  
     865                  870                  875                  880  
 60    Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly  
     885                  890                  895

Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu  
 900 905 910  
 Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln Ser Leu Gln Val  
 915 920 925  
 5 Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Val Ser Phe  
 930 935 940  
 Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg  
 945 950 955 960  
 Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn Phe Gln Asp Val  
 965 970 975  
 10 Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met Ala Val Gly Gln  
 980 985 990  
 Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala Ala  
 995 1000 1005  
 15 His Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile Asp Ser Tyr Ser  
 1010 1015 1020  
 Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Asn  
 1025 1030 1035 1040  
 Glu Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln  
 1045 1050 1055  
 Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly  
 1060 1065 1070  
 Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe  
 1075 1080 1085  
 20 Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly Lys Glu Ile Lys  
 1090 1095 1100  
 His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln  
 1105 1110 1115 1120  
 Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly  
 1125 1130 1135  
 30 Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Met Gln Ala Ala Lys  
 1140 1145 1150  
 Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro Glu Lys Tyr Asn  
 1155 1160 1165  
 35 Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln  
 1170 1175 1180  
 Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu  
 1185 1190 1195 1200  
 Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val  
 1205 1210 1215  
 40 Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile  
 1220 1225 1230  
 Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe  
 1235 1240 1245  
 45 Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala  
 1250 1255 1260  
 Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Ala Lys  
 1265 1270 1275 1280  
 Arg

50  
 <210> 24  
 <211> 4279  
 <212> DNA  
 55 <213> Canis familiaris  
  
 <220>  
 <221> CDS  
 <222> (17)...(3859)

<400> 24

|            |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ggagcgcgag | atg | gat | cct | gaa | gga | ggc | cgt | aag | ggg | agt | gca | gag | 52  |     |     |     |     |
|            | Met | Asp | Pro | Glu | Gly | Gly | Arg | Lys | Gly | Ser | Ala | Glu |     |     |     |     |     |
|            | 1   |     |     |     | 5   |     |     |     |     |     | 10  |     |     |     |     |     |     |
| 5          | aag | aac | tcc | tgg | aaa | atg | ggc | aaa | aaa | agt | aaa | aaa | gag | aag | aaa | 100 |     |
|            | Lys | Asn | Phe | Trp | Lys | Met | Gly | Lys | Lys | Ser | Lys | Lys | Lys | Glu | Lys |     |     |
|            | 15  |     |     |     | 20  |     |     |     |     |     | 25  |     |     |     |     |     |     |
| 10         | gaa | aag | aaa | cca | act | gtc | agc | acg | ttt | gca | atg | ttt | cgc | tat | tca | aat | 148 |
|            | Glu | Lys | Lys | Pro | Thr | Val | Ser | Thr | Phe | Ala | Met | Phe | Arg | Tyr | Ser | Asn |     |
|            | 30  |     |     |     | 35  |     |     |     |     |     | 40  |     |     |     |     |     |     |
| 15         | tgg | ctt | gat | agg | ttg | tat | atg | ttg | gtg | ggg | aca | atg | gct | gcc | atc | atc | 196 |
|            | Trp | Leu | Asp | Arg | Leu | Tyr | Met | Leu | Val | Gly | Thr | Met | Ala | Ala | Ile | Ile |     |
|            | 45  |     |     |     | 50  |     |     |     |     | 55  |     |     | 60  |     |     |     |     |
| 20         | cat | gga | gct | gca | ctc | cct | ctc | atg | atg | ctg | gtt | ttt | gga | aac | atg | aca | 244 |
|            | His | Gly | Ala | Ala | Leu | Pro | Leu | Met | Met | Leu | Val | Phe | Gly | Asn | Met | Thr |     |
|            | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     |     |     |     |
| 25         | gat | agc | ttt | gca | aat | gca | gga | att | tca | aga | aac | aaa | act | ttt | cca | gtt | 292 |
|            | Asp | Ser | Phe | Ala | Asn | Ala | Gly | Ile | Ser | Arg | Asn | Lys | Thr | Phe | Pro | Val |     |
|            | 80  |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     |     |     |
| 30         | ata | att | aat | gaa | agt | att | acg | aac | aat | aca | caa | cat | ttc | atc | aac | cat | 340 |
|            | Ile | Ile | Asn | Glu | Ser | Ile | Thr | Asn | Asn | Thr | Gln | His | Phe | Ile | Asn | His |     |
|            | 95  |     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     |     |     |
| 35         | ctg | gag | gag | gaa | atg | acc | acg | tat | gcc | tat | tat | tac | agt | ggg | atc | ggt | 388 |
|            | Leu | Glu | Glu | Met | Thr | Thr | Tyr | Ala | Tyr | Tyr | Tyr | Ser | Gly | Ile | Gly |     |     |
|            | 110 |     |     | 115 |     |     |     |     |     | 120 |     |     |     |     |     |     |     |
| 40         | gct | ggc | gtg | ctg | gtg | gct | gct | tac | atc | cag | gtt | tca | ttc | tgg | tgc | ctg | 436 |
|            | Ala | Gly | Val | Leu | Val | Ala | Ala | Tyr | Ile | Gln | Val | Ser | Phe | Trp | Cys | Leu |     |
|            | 125 |     |     | 130 |     |     |     |     | 135 |     |     | 140 |     |     |     |     |     |
| 45         | gca | gca | gga | aga | cag | ata | ctc | aaa | att | aga | aaa | caa | ttt | ttt | cat | gtt | 484 |
|            | Ala | Ala | Gly | Arg | Gln | Ile | Leu | Lys | Ile | Arg | Lys | Gln | Phe | Phe | His | Ala |     |
|            | 145 |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     |     |     |     |
| 50         | atc | atg | cga | cag | gag | att | ggc | tgg | ttt | gac | gtg | cat | gac | gtt | ggg | gag | 532 |
|            | Ile | Met | Arg | Gln | Glu | Ile | Gly | Trp | Phe | Asp | Val | His | Asp | Val | Gly | Glu |     |
|            | 160 |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     |     |     |     |
| 55         | ctt | aac | acc | cgg | ctc | aca | gac | gat | gtc | tcc | aaa | atc | aat | gaa | gga | att | 580 |
|            | Leu | Asn | Thr | Arg | Leu | Thr | Asp | Asp | Val | Ser | Lys | Ile | Asn | Glu | Gly | Ile |     |
|            | 175 |     |     | 180 |     |     |     |     |     | 185 |     |     |     |     |     |     |     |
| 60         | ggc | gac | aaa | att | gga | atg | ttc | ttt | caa | tca | ata | gca | aca | ttt | ttc | acc | 628 |
|            | Gly | Asp | Lys | Ile | Gly | Met | Phe | Phe | Gln | Ser | Ile | Ala | Thr | Phe | Phe | Thr |     |
|            | 190 |     |     | 195 |     |     |     |     | 200 |     |     |     |     |     |     |     |     |
| 65         | ggt | ttt | ata | gtg | ggg | ttt | aca | cgt | ggt | tgg | aag | cta | acc | ttt | gtg | att | 676 |
|            | Gly | Phe | Ile | Val | Gly | Phe | Thr | Arg | Gly | Trp | Lys | Leu | Thr | Leu | Val | Ile |     |
|            | 205 |     |     | 210 |     |     |     |     | 215 |     |     | 220 |     |     |     |     |     |
| 70         | ttg | gcc | atc | agc | cct | gtt | ctt | gga | ctt | tca | gcc | atc | tgg | gca | aag | 724 |     |
|            | Leu | Ala | Ile | Ser | Pro | Val | Leu | Gly | Leu | Ser | Ala | Ala | Ile | Trp | Ala | Lys |     |
|            | 225 |     |     | 230 |     |     |     |     | 235 |     |     |     |     |     |     |     |     |

|    |   |      |
|----|---|------|
|    | ata cta tct tca ttt act gat aaa gaa ctc ttg gcc tat gca aaa gct<br>Ile Leu Ser Ser Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala<br>240 245 250     | 772  |
| 5  | gga gca gta gct gaa gaa gtc tta gca gca atc aga act gtg att gcc<br>Gly Ala Val Ala Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala<br>255 260 265     | 820  |
| 10 | ttt gga gga caa aag aaa gaa ctt gaa agg tac aac aaa aat tta gaa<br>Phe Gly Gly Gln Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu<br>270 275 280     | 868  |
| 15 | gaa gct aaa gga att ggg ata aag aaa gct atc acg gcc aac att tct<br>Glu Ala Lys Gly Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser<br>285 290 295 300 | 916  |
| 20 | att ggt gcc gct ttc tta ttg atc tat gca tca tat gct ctg gct ttc<br>Ile Gly Ala Ala Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe<br>305 310 315     | 964  |
| 25 | tgg tat ggg acc tcc ttg gtc ctc tcc agt gaa tat tct att gga caa<br>Trp Tyr Gly Thr Ser Leu Val Leu Ser Ser Glu Tyr Ser Ile Gly Gln<br>320 325 330     | 1012 |
| 30 | gta ctc act gtc ttc ttt tct gta tta att ggg gct ttt agt att gga<br>Val Leu Thr Val Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly<br>335 340 345     | 1060 |
| 35 | cag gca tcc cca agc att gaa gca ttt gca aac gca aga gga gca gct<br>Gln Ala Ser Pro Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala<br>350 355 360     | 1108 |
| 40 | tat gaa atc ttc aag ata att gac aat aaa cca agc att gac agc tat<br>Tyr Glu Ile Phe Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr<br>365 370 375 380 | 1156 |
| 45 | tcg aag agt gga cat aaa cca gat aat att aag gga aat ttg gaa ttc<br>Ser Lys Ser Gly His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe<br>385 390 395     | 1204 |
| 50 | aaa aat gtt cac ttc agt tac cct tct cga aaa gaa gtt aag atc tta<br>Lys Asn Val His Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu<br>400 405 410     | 1252 |
| 55 | aag ggt ctc aac ctg aag gtt cag agt ggg cag aca gtg gcg ctg gtt<br>Lys Gly Leu Asn Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val<br>415 420 425     | 1300 |
| 60 | agg acc ata aat gta agg cat ctt cg gaa att act ggt gtg gtg agt<br>Arg Thr Ile Asn Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser<br>465 470 475      | 1444 |

|    |   |      |
|----|---|------|
|    | cag gag cct gtg ttg ttt gcc acc acg ata gct gaa aac att cgc tat<br>Gln Glu Pro Val Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr<br>480 485 490     | 1492 |
| 5  | ggc cgc gaa aat gtc acc atg gat gag att gag aaa gct gtt aag gaa<br>Gly Arg Glu Asn Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu<br>495 500 505     | 1540 |
| 10 | gcc aat gcc tat gat ttt atc atg aaa cta cct aat aaa ttt gac act<br>Ala Asn Ala Tyr Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr<br>510 515 520     | 1588 |
| 15 | ctg gtt gga gag aga ggg gcc cag ctg agt ggt gga cag aaa cag aga<br>Leu Val Gly Glu Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg<br>525 530 535 540 | 1636 |
| 20 | atc gcc att gct cgg gcc ctg gtt cgc aac ccc aag att ctt ctg ctg<br>Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Leu<br>545 550 555     | 1684 |
| 25 | gat gag gca acg tca gct ctg gac act gaa agt gaa gca gtg gtt cag<br>Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln<br>560 565 570     | 1732 |
| 30 | gtg gcc ctg gat aag gcc aga aaa ggc cgg act acc att gtg ata gct<br>Val Ala Leu Asp Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala<br>575 580 585     | 1780 |
| 35 | cat cgt ttg tct aca gtt cgt aat gcc gat gtc att gct ggt ttt gat<br>His Arg Leu Ser Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp<br>590 595 600     | 1828 |
| 40 | gat gga gtc att gtg gag aaa gga aat cat gat gaa ctc atg aaa gag<br>Asp Gly Val Ile Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu<br>605 610 615 620 | 1876 |
| 45 | aag ggc att tac ttc aaa ctt gtc aca atg cag aca aga gga aat gaa<br>Lys Gly Ile Tyr Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu<br>625 630 635     | 1924 |
| 50 | att gag tta gaa aat gcc act ggt gaa tcc aaa agt gaa agt gat gcc<br>Ile Glu Leu Glu Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala<br>640 645 650     | 1972 |
| 55 | ttg gaa atg tct cca aaa gat tca ggg tcc agt tta ata aaa aga aga<br>Leu Glu Met Ser Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg<br>655 660 665     | 2020 |
| 60 | tca act cgc agg agt ata cat gca cca caa ggc caa gac aga aag ctt<br>Ser Thr Arg Arg Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu<br>670 675 680     | 2068 |
|    | ggt aca aaa gag gac ttg aat gag aat gta cct cca gtt tcc ttc tgg<br>Gly Thr Lys Glu Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp<br>685 690 695 700 | 2116 |
|    | agg att ctg aag ctg aac tca act gaa tgg cct tat ttt gtg gtt ggt<br>Arg Ile Leu Lys Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly<br>705 710 715     | 2164 |

|    |   |      |
|----|---|------|
|    | ata ttt tgt gct att ata aac gga ggc ctg caa cca gca ttt tca ata<br>Ile Phe Cys Ala Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile<br>720 725 730     | 2212 |
| 5  | ata ttt tca agg att ata ggg atc ttt acc cga gat gag gat cct gaa<br>Ile Phe Ser Arg Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu<br>735 740 745     | 2260 |
| 10 | aca aaa cga cag aat agt aac atg ttt tct gta ttg ttt cta gtc ctt<br>Thr Lys Arg Gln Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu<br>750 755 760     | 2308 |
| 15 | gga att att tct ttt att aca ttt ttc ctc cag ggc ttc aca ttt ggc<br>Gly Ile Ile Ser Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly<br>765 770 775 780 | 2356 |
| 20 | aaa gct ggg gag atc ctc act aag cgg ctt cga tac atg gtt ttc aga<br>Lys Ala Gly Glu Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg<br>785 790 795     | 2404 |
| 25 | tcc atg ctg aga cag gat gtc agc tgg ttt gat gac cct aaa aac acc<br>Ser Met Leu Arg Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr<br>800 805 810     | 2452 |
| 30 | act gga gca ttg aca acc agg ctt gcc aat gat gcg gct caa gtt aaa<br>Thr Gly Ala Leu Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys<br>815 820 825     | 2500 |
| 35 | ggg gct ata ggt tcc agg ctt gct gtc att acc cag aat ata gca aat<br>Gly Ala Ile Gly Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn<br>830 835 840     | 2548 |
| 40 | ctt ggg aca ggc att att ata tcc tta atc tat ggt tgg caa tta aca<br>Leu Gly Thr Gly Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr<br>845 850 855 860     | 2596 |
| 45 | ctt tta ctc tta gca att gta ccc atc att gca ata gca gga gtt gtt<br>Leu Leu Leu Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val<br>865 870 875         | 2644 |
| 50 | gaa atg aaa atg ttg tct gga caa gca ctg aaa gat aag aaa gag cta<br>Glu Met Lys Met Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu<br>880 885 890     | 2692 |
| 55 | gaa gga gct ggg aag att gct aca gaa gcc atc gaa aac ttc cga act<br>Glu Gly Ala Gly Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr<br>895 900 905     | 2740 |
| 60 | gtt gtt tct ttg act cgg gag cag aag ttt gaa tac atg tat gca cag<br>Val Val Ser Leu Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln<br>910 915 920     | 2788 |
|    | agt ttg caa gta cca tac aga aac tct ttg agg aaa gca cac atc ttc<br>Ser Leu Gln Val Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe<br>925 930 935 940 | 2836 |
|    | ggg gtc tca ttt tct atc acc cag gca atg atg tat ttt tcc tat gct<br>Gly Val Ser Phe Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala<br>945 950 955     | 2884 |

|    |   |      |
|----|---|------|
|    | ggc tgt ttc cgg ttt ggt gcc tac ttg gtg gca aat gag ttc atg aac<br>Gly Cys Phe Arg Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn<br>960 965 970         | 2932 |
| 5  | ttt cag gat gtt ctt ttg gta ttc tca gct att gtc ttt ggt gcc atg<br>Phe Gln Asp Val Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met<br>975 980 985         | 2980 |
| 10 | gca gtg ggg cag gtc agt tca ttt gct cct gac tat gcc aaa gcc aaa<br>Ala Val Gly Gln Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys<br>990 995 1000        | 3028 |
| 15 | gta tca gca gcc cac gtc atc atg atc att gaa aaa agc cct ctg att<br>Val Ser Ala Ala His Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile<br>1005 1010 1015 1020 | 3076 |
| 20 | gac agc tac agc cct cac ggc ctc aag cca aat acg ttg gaa gga aat<br>Asp Ser Tyr Ser Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn<br>1025 1030 1035      | 3124 |
| 25 | gtg aca ttt aat gag gtc gtg ttc aac tat ccc act cga cca gac atc<br>Val Thr Phe Asn Glu Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile<br>1040 1045 1050      | 3172 |
| 30 | ccc gtg ctc cag ggg ctg agc ctc gag gtg aag aag ggc cag acg ctg<br>Pro Val Leu Gln Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu<br>1055 1060 1065      | 3220 |
| 35 | gcc ctc gta ggt agc agt ggc tgt ggg aag agc aca gtt gtt cag ctc<br>Ala Leu Val Gly Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu<br>1070 1075 1080      | 3268 |
| 40 | cta gag cgc ttc tat gac ccc ttg gct ggt tca gtg cta att gat ggc<br>Leu Glu Arg Phe Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly<br>1085 1090 1095 1100 | 3316 |
| 45 | aaa gag ata aag cac ctg aat gtc cag tgg ctc cga gca cac ctg ggc<br>Lys Glu Ile Lys His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly<br>1105 1110 1115      | 3364 |
| 50 | atc gtg tct cag gag ccc atc ctg ttt gac tgc agc att gcc gag aac<br>Ile Val Ser Gln Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn<br>1120 1125 1130      | 3412 |
| 55 | att gcc tat gga gac aac agc cgg gtc gta tca cat gaa gag att atg<br>Ile Ala Tyr Gly Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Met<br>1135 1140 1145      | 3460 |
| 60 | cag gca gcc aag gag gcc aac ata cac cac ttc atc gag aca ctc cct<br>Gln Ala Ala Lys Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro<br>1150 1155 1160      | 3508 |
|    | gag aaa tac aac acc aga gta gga gac aaa gga acc cag ctc tct ggt<br>Glu Lys Tyr Asn Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly<br>1165 1170 1175 1180 | 3556 |
|    | ggc cag aaa cag cgc att gcc ata gct cgc gct ctt gtt aga cag cct<br>Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro<br>1185 1190 1195      | 3604 |

|    |   |                          |
|----|---|--------------------------|
|    | cat att ttg ctt ttg gat gaa gct aca tca gct ctg gat aca gaa agt<br>His Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser<br>1200 1205 1210  | 3652                     |
| 5  | gaa aag gtt gtc caa gaa gcc ctg gac aaa gcc aga gaa ggc cgc acc<br>Glu Lys Val Val Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr<br>1215 1220 1225  | 3700                     |
| 10 | tgc att gtg atc gcc cac cgc ttg tcc acc atc cag aat gca gat tta<br>Cys Ile Val Ile Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu<br>1230 1235 1240  | 3748                     |
| 15 | ata gtg gtg ttt cag aat ggc aaa gtc aag gag cat ggc aca cat caa<br>Ile Val Val Phe Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln<br>1245 1250 1255 1260   | 3796                     |
| 20 | cag ctg ctg gcc cag aaa ggc atc tat ttt tcc atg gtc agt gtc cag<br>Gln Leu Leu Ala Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln<br>1265 1270 1275  | 3844                     |
|    | gct gga gca aag cgc tagtgaactg tggccatatg agctgttaaa tatttttaa<br>Ala Gly Ala Lys Arg<br>1280   | 3899                     |
| 25 | tatttgtgtt aaaacatggc attaatcaa agttaaaagg tgagcactta ctggaaaaac<br>tatgtagaac tacctgttta acatttcttg ctgcaactga agatcattcc accaagttca<br>gagtcctcag atttataat taaaggaacc aaaagaaaaca ttatctgatg gaataaaata<br>ctggtgttaa ttgcattata aaattataga gtaattcaaa gtagattttg ttaataaatt<br>gtataatttt tgtttatatt ttatttgtaa cttactgctt tgctgaaaga ttatagaagt<br>ggtaaaaaagt actgaatgtt tgaataaaagt gctagctata ataaaactaa acttttatat<br>aaaaaaaaaaaaaaa 4259 | 3959 4019 4079 4139 4199 |
| 30 | <210> 25<br><211> 1281<br><212> PRT<br><213> Canis familiaris   |                          |
|    | <400> 25  |                          |
| 35 | Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu Lys Asn Phe Trp<br>1 5 10 15<br>Lys Met Gly Lys Lys Ser Lys Lys Lys Glu Lys Lys Glu Lys Lys Pro<br>20 25 30   |                          |
| 40 | Thr Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn Trp Leu Asp Arg<br>35 40 45<br>Leu Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile His Gly Ala Ala<br>50 55 60  |                          |
|    | Leu Pro Leu Met Met Leu Val Phe Gly Asn Met Thr Asp Ser Phe Ala<br>65 70 75 80  |                          |
| 45 | Asn Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val Ile Ile Asn Glu<br>85 90 95<br>Ser Ile Thr Asn Asn Thr Gln His Phe Ile Asn His Leu Glu Glu Glu<br>100 105 110   |                          |
| 50 | Met Thr Thr Tyr Ala Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu<br>115 120 125  |                          |
|    | Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg<br>130 135 140  |                          |
| 55 | Gln Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln<br>145 150 155 160  |                          |
| 60 | Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg   |                          |

|    |   |     |     |
|----|---|-----|-----|
|    | 165   | 170 | 175 |
|    | Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Ile |     |     |
|    | 180   | 185 | 190 |
| 5  | Gly Met Phe Phe Gln Ser Ile Ala Thr Phe Phe Thr Gly Phe Ile Val |     |     |
|    | 195   | 200 | 205 |
|    | Gly Phe Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser |     |     |
|    | 210   | 215 | 220 |
|    | Pro Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys Ile Leu Ser Ser |     |     |
|    | 225   | 230 | 235 |
| 10 | Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala |     |     |
|    | 245   | 250 | 255 |
|    | Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln |     |     |
|    | 260   | 265 | 270 |
| 15 | Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Gly |     |     |
|    | 275   | 280 | 285 |
|    | Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala |     |     |
|    | 290   | 295 | 300 |
|    | Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr |     |     |
|    | 305   | 310 | 315 |
| 20 | Ser Leu Val Leu Ser Ser Glu Tyr Ser Ile Gly Gln Val Leu Thr Val |     |     |
|    | 325   | 330 | 335 |
|    | Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly Gln Ala Ser Pro |     |     |
|    | 340   | 345 | 350 |
| 25 | Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe |     |     |
|    | 355   | 360 | 365 |
|    | Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly |     |     |
|    | 370   | 375 | 380 |
|    | His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Lys Asn Val His |     |     |
|    | 385   | 390 | 395 |
| 30 | Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn |     |     |
|    | 405   | 410 | 415 |
|    | Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly |     |     |
|    | 420   | 425 | 430 |
|    | Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro |     |     |
|    | 435   | 440 | 445 |
|    | Thr Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile Arg Thr Ile Asn |     |     |
|    | 450   | 455 | 460 |
|    | Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser Gln Glu Pro Val |     |     |
|    | 465   | 470 | 475 |
| 40 | Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn |     |     |
|    | 485   | 490 | 495 |
|    | Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr |     |     |
|    | 500   | 505 | 510 |
| 45 | Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr Leu Val Gly Glu |     |     |
|    | 515   | 520 | 525 |
|    | Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala |     |     |
|    | 530   | 535 | 540 |
|    | Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Asp Glu Ala Thr     |     |     |
|    | 545   | 550 | 555 |
| 50 | Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp |     |     |
|    | 565   | 570 | 575 |
|    | Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser |     |     |
|    | 580   | 585 | 590 |
|    | Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile |     |     |
|    | 595   | 600 | 605 |
| 55 | Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr |     |     |
|    | 610   | 615 | 620 |
|    | Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu Ile Glu Leu Glu |     |     |
|    | 625   | 630 | 635 |
| 60 | Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met Ser |     |     |

|    |   |      |      |
|----|---|------|------|
|    | 645   | 650  | 655  |
|    | Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg Arg |      |      |
|    | 660   | 665  | 670  |
| 5  | Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys Glu |      |      |
|    | 675   | 680  | 685  |
|    | Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp Arg Ile Leu Lys |      |      |
|    | 690   | 695  | 700  |
|    | Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly Ile Phe Cys Ala |      |      |
|    | 705   | 710  | 715  |
| 10 | Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser Arg |      |      |
|    | 725   | 730  | 735  |
|    | Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg Gln |      |      |
|    | 740   | 745  | 750  |
| 15 | Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile Ser |      |      |
|    | 755   | 760  | 765  |
|    | Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu |      |      |
|    | 770   | 775  | 780  |
|    | Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg |      |      |
|    | 785   | 790  | 795  |
| 20 | Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu |      |      |
|    | 805   | 810  | 815  |
|    | Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly |      |      |
|    | 820   | 825  | 830  |
| 25 | Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly |      |      |
|    | 835   | 840  | 845  |
|    | Ile Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu     |      |      |
|    | 850   | 855  | 860  |
|    | Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met |      |      |
|    | 865   | 870  | 875  |
| 30 | Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly |      |      |
|    | 885   | 890  | 895  |
|    | Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu |      |      |
|    | 900   | 905  | 910  |
| 35 | Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln Ser Leu Gln Val |      |      |
|    | 915   | 920  | 925  |
|    | Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Val Ser Phe |      |      |
|    | 930   | 935  | 940  |
|    | Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg |      |      |
|    | 945   | 950  | 955  |
| 40 | Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn Phe Gln Asp Val |      |      |
|    | 965   | 970  | 975  |
|    | Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met Ala Val Gly Gln |      |      |
|    | 980   | 985  | 990  |
| 45 | Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala Ala |      |      |
|    | 995   | 1000 | 1005 |
|    | His Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile Asp Ser Tyr Ser |      |      |
|    | 1010  | 1015 | 1020 |
|    | Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Asn |      |      |
|    | 1025  | 1030 | 1035 |
| 50 | Glu Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln |      |      |
|    | 1045  | 1050 | 1055 |
|    | Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly |      |      |
|    | 1060  | 1065 | 1070 |
| 55 | Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe |      |      |
|    | 1075  | 1080 | 1085 |
|    | Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly Lys Glu Ile Lys |      |      |
|    | 1090  | 1095 | 1100 |
|    | His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln |      |      |
|    | 1105  | 1110 | 1115 |
| 60 | Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly |      |      |
|    |   |      | 1120 |

|    |   |      |      |
|----|---|------|------|
|    | 1125  | 1130 | 1135 |
|    | Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Met Gln Ala Ala Lys |      |      |
|    | 1140  | 1145 | 1150 |
| 5  | Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro Glu Lys Tyr Asn |      |      |
|    | 1155  | 1160 | 1165 |
|    | Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln |      |      |
|    | 1170  | 1175 | 1180 |
|    | Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu |      |      |
| 10 | 1185  | 1190 | 1195 |
|    | Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val |      | 1200 |
|    | 1205  | 1210 | 1215 |
|    | Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile |      |      |
|    | 1220  | 1225 | 1230 |
| 15 | Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe |      |      |
|    | 1235  | 1240 | 1245 |
|    | Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala |      |      |
|    | 1250  | 1255 | 1260 |
|    | Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Ala Lys |      |      |
| 20 | 1265  | 1270 | 1275 |
|    | Arg   |      | 1280 |

|    |   |    |     |     |    |
|----|---|----|-----|-----|----|
|    | <210> 26  |    |     |     |    |
| 25 | <211> 4279  |    |     |     |    |
|    | <212> DNA   |    |     |     |    |
|    | <213> Canis familiaris  |    |     |     |    |
|    | <220>   |    |     |     |    |
| 30 | <221> CDS   |    |     |     |    |
|    | <222> (17)...(3859)   |    |     |     |    |
|    | <400> 26  |    |     |     |    |
|    | ggagcgcgag gtcggg atg gat cct gaa gga ggc cgt aag ggg agt gca gag |    | 52  |     |    |
| 35 | Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu                   | 1  | 5   | 10  |    |
|    | aag aac ttc tgg aaa atg ggc aaa aaa agt aaa aaa aaa gag aag aaa   |    |     | 100 |    |
|    | Lys Asn Phe Trp Lys Met Gly Lys Ser Lys Lys Lys Glu Lys Lys       | 15 | 20  | 25  |    |
| 40 | gaa aag aaa cca act gtc acg acg ttt gca atg ttt cgc tat tca aat   |    |     | 148 |    |
|    | Glu Lys Lys Pro Thr Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn   | 30 | 35  | 40  |    |
| 45 | tgg ctt gat agg ttg tat atg ttg gtg ggg aca atg gct gcc atc atc   |    |     | 196 |    |
|    | Trp Leu Asp Arg Leu Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile   | 45 | 50  | 55  | 60 |
| 50 | cat gga gct gca ctc cct ctc atg atg ctg gtt ttt gga aac atg aca   |    |     | 244 |    |
|    | His Gly Ala Ala Leu Pro Leu Met Met Leu Val Phe Gly Asn Met Thr   | 65 | 70  | 75  |    |
| 55 | gat agc ttt gca aat gca gga att tca aga aac aaa act ttt cca gtt   |    |     | 292 |    |
|    | Asp Ser Phe Ala Asn Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val   | 80 | 85  | 90  |    |
| 60 | ata att aat gaa agt att acg aac aat aca caa cat ttc atc aac cat   |    |     | 340 |    |
|    | Ile Ile Asn Glu Ser Ile Thr Asn Asn Thr Gln His Phe Ile Asn His   | 95 | 100 | 105 |    |

|    |   |      |
|----|---|------|
|    | ctg gag gag gaa atg acc acg tat gcc tat tat tac agt ggg atc ggt<br>Leu Glu Glu Glu Met Thr Thr Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly<br>110 115 120     | 388  |
| 5  | gct ggc gtg ctg gtg gct tac atc cag gtt tca ttc tgg tgc ctg<br>Ala Gly Val Leu Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu<br>125 130 135 140     | 436  |
| 10 | gca gca gga aga cag ata ctc aaa att aga aaa caa ttt ttt cat gct<br>Ala Ala Gly Arg Gln Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala<br>145 150 155     | 484  |
| 15 | atc atg cga cag gag att ggc tgg ttt gac gtg cat gac gtt ggg gag<br>Ile Met Arg Gln Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu<br>160 165 170     | 532  |
| 20 | ctt aac acc cgg ctc aca gac gat gtc tcc aaa atc aat gaa gga att<br>Leu Asn Thr Arg Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile<br>175 180 185     | 580  |
| 25 | ggc gac aaa att gga atg ttc ttt caa tca ata gca aca ttt ttc acc<br>Gly Asp Lys Ile Gly Met Phe Phe Gln Ser Ile Ala Thr Phe Thr<br>190 195 200         | 628  |
| 30 | ggt ttt ata gtg ggg ttt aca cgt ggt tgg aag cta acc ctt gtg att<br>Gly Phe Ile Val Gly Phe Thr Arg Gly Trp Lys Leu Thr Leu Val Ile<br>205 210 215 220 | 676  |
| 35 | ttg gcc atc agc cct gtt ctt gga ctt tca gcc gcc atc tgg gca aag<br>Leu Ala Ile Ser Pro Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys<br>225 230 235     | 724  |
| 40 | ata cta tct tca ttt act gat aaa gaa ctc ttg gcc tat gca aaa gct<br>Ile Leu Ser Ser Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala<br>240 245 250     | 772  |
| 45 | gga gca gta gct gaa gaa gtc tta gca gca atc aga act gtg att gcc<br>Gly Ala Val Ala Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala<br>255 260 265     | 820  |
| 50 | ttt gga gga caa aag aaa gaa ctt gaa agg tac aac aaa aat tta gaa<br>Phe Gly Gly Gln Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu<br>270 275 280     | 868  |
| 55 | gaa gct aaa gga att ggg ata aag aaa gct atc acg gcc aac att tct<br>Glu Ala Lys Gly Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser<br>285 290 295 300 | 916  |
| 60 | att ggt gcc gct ttc tta ttg atc tat gca tca tat gct ctg gct ttc<br>Ile Gly Ala Ala Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe<br>305 310 315     | 964  |
|    | tgg tat ggg acc tcc ttg gtc ctc tcc agt gaa tat act att gga caa<br>Trp Tyr Gly Thr Ser Leu Val Leu Ser Ser Glu Tyr Thr Ile Gly Gln<br>320 325 330     | 1012 |
|    | gta ctc act gtc ttc ttt tct gta tta att ggg gct ttt agt att gga<br>Val Leu Thr Val Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly<br>335 340 345     | 1060 |

|    |   |      |
|----|---|------|
|    | cag gca tcc cca agc att gaa gca ttt gca aac gca aga gga gca gct<br>Gln Ala Ser Pro Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala<br>350 355 360     | 1108 |
| 5  | tat gaa atc ttc aag ata att gac aat aaa cca agc att gac agc tat<br>Tyr Glu Ile Phe Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr<br>365 370 375 380 | 1156 |
| 10 | tcg aag agt gga cat aaa cca gat aat att aag gga aat ttg gaa ttc<br>Ser Lys Ser Gly His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe<br>385 390 395     | 1204 |
| 15 | aaa aat gtt cac ttc agt tac cct tct cga aaa gaa gtt aag atc tta<br>Lys Asn Val His Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu<br>400 405 410     | 1252 |
| 20 | aag ggt ctc aac ctg aag gtt cag agt ggg cag aca gtg gcg ctg gtt<br>Lys Gly Leu Asn Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val<br>415 420 425     | 1300 |
| 25 | ggg aac agt ggc tgc ggg aag agc acg acc gtg cag ctg atg cag agg<br>Gly Asn Ser Gly Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg<br>430 435 440     | 1348 |
| 30 | ctc tat gac ccc aca gat ggc atg gtc tgt att gat gga cag gac att<br>Leu Tyr Asp Pro Thr Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile<br>445 450 455 460 | 1396 |
| 35 | agg acc ata aat gta agg cat ctt cgg gaa att act ggt gtg gtg agt<br>Arg Thr Ile Asn Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser<br>465 470 475     | 1444 |
| 40 | cag gag cct gtg ttg ttt gcc acc acg ata gct gaa aac att cgc tat<br>Gln Glu Pro Val Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr<br>480 485 490     | 1492 |
| 45 | ggc cgc gaa aat gtc acc atg gat gag att gag aaa gct gtt aag gaa<br>Gly Arg Glu Asn Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu<br>495 500 505     | 1540 |
| 50 | gcc aat gcc tat gat ttt atc atg aaa cta cct aat aaa ttt gac act<br>Ala Asn Ala Tyr Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr<br>510 515 520     | 1588 |
| 55 | ctg gtt gga gag aga ggg gcc cag ctg agt ggt gga cag aaa cag aga<br>Leu Val Gly Glu Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg<br>525 530 535 540 | 1636 |
| 60 | atc gcc att gct cgg gcc ctg gtt cgc aac ccc aag att ctt ctg ctg<br>Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Leu<br>545 550 555     | 1684 |
|    | gat gag gca acg tca gct ctg gac act gaa agt gaa gca gtg gtt cag<br>Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln<br>560 565 570     | 1732 |
|    | gtg gcc ctg gat aag gcc aga aaa ggc cgg act acc att gtg ata gct<br>Val Ala Leu Asp Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala<br>575 580 585     | 1780 |

|    |   |      |
|----|---|------|
|    | cat cgt ttg tct aca gtt cgt aat gcc gat gtc att gct ggt ttt gat<br>His Arg Leu Ser Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp<br>590 595 600     | 1828 |
| 5  | gat gga gtc att gtg gag aaa gga aat cat gat gaa ctc atg aaa gag<br>Asp Gly Val Ile Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu<br>605 610 615 620 | 1876 |
| 10 | aag ggc att tac ttc aaa ctt gtc aca atg cag aca aga gga aat gaa<br>Lys Gly Ile Tyr Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu<br>625 630 635     | 1924 |
| 15 | att gag tta gaa aat gcc act ggt gaa tcc aaa agt gaa agt gat gcc<br>Ile Glu Leu Glu Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala<br>640 645 650     | 1972 |
| 20 | ttg gaa atg tct cca aaa gat tca ggg tcc agt tta ata aaa aga aga<br>Leu Glu Met Ser Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg<br>655 660 665     | 2020 |
| 25 | tca act cgc agg agt ata cat gca cca caa ggc caa gac aga aag ctt<br>Ser Thr Arg Arg Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu<br>670 675 680     | 2068 |
| 30 | ggg att ctg aag ctg aac tca act gaa tgg cct tat ttt gtg gtt ggt<br>Arg Ile Leu Lys Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly<br>705 710 715     | 2116 |
| 35 | ata ttt tgt gct att ata aac gga ggc ctg caa cca gca ttt tca ata<br>Ile Phe Cys Ala Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile<br>720 725 730         | 2164 |
| 40 | ata ttt tca agg att ata ggg atc ttt acc cga gat gag gat cct gaa<br>Ile Phe Ser Arg Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu<br>735 740 745     | 2212 |
| 45 | aca aaa cga cag aat agt aac atg ttt tct gta ttg ttt cta gtc ctt<br>Thr Lys Arg Gln Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu<br>750 755 760     | 2260 |
| 50 | gga att att tct ttt att aca ttt ttc ctc cag ggc ttc aca ttt ggc<br>Gly Ile Ile Ser Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly<br>765 770 775 780 | 2308 |
| 55 | aaa gct ggg gag atc ctc act aag cgg ctt cga tac atg gtt ttc aga<br>Lys Ala Gly Glu Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg<br>785 790 795     | 2356 |
| 60 | tcc atg ctg aga cag gat gtc agc tgg ttt gat gac cct aaa aac acc<br>Ser Met Leu Arg Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr<br>800 805 810     | 2404 |
|    | act gga gca ttg aca acc agg ctt gcc aat gat gcg gct caa gtt aaa<br>Thr Gly Ala Leu Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys<br>815 820 825     | 2452 |
|    |   | 2500 |

|    |   |      |
|----|---|------|
|    | ggg gct ata ggt tcc agg ctt gct gtc att acc cag aat ata gca aat<br>Gly Ala Ile Gly Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn<br>830 835 840         | 2548 |
| 5  | ctt ggg aca ggc att att ata tcc tta atc tat ggt tgg caa tta aca<br>Leu Gly Thr Gly Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr<br>845 850 855 860         | 2596 |
| 10 | ctt tta ctc tta gca att gta ccc atc att gca ata gca gga gtt gtt<br>Leu Leu Leu Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val<br>865 870 875             | 2644 |
| 15 | gaa atg aaa atg ttg tct gga caa gca ctg aaa gat aag aaa gag cta<br>Glu Met Lys Met Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu<br>880 885 890         | 2692 |
| 20 | gaa gga gct ggg aag att gct aca gaa gcc atc gaa aac ttc cga act<br>Glu Gly Ala Gly Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr<br>895 900 905         | 2740 |
|    | gtt gtt tct ttg act cggtt ggg cag aag ttt gaa tac atg tat gca cag<br>Val Val Ser Leu Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln<br>910 915 920       | 2788 |
| 25 | agt ttg caa gta cca tac aga aac tct ttg agg aaa gca cac atc ttc<br>Ser Leu Gln Val Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe<br>925 930 935 940     | 2836 |
| 30 | ggg gtc tca ttt tct atc acc cag gca atg atg tat ttt tcc tat gct<br>Gly Val Ser Phe Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala<br>945 950 955         | 2884 |
| 35 | ggc tgt ttc cgg ttt ggt gcc tac ttg gtg gca aat gag ttc atg aac<br>Gly Cys Phe Arg Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn<br>960 965 970         | 2932 |
| 40 | ttt cag gat gtt ctt ttg gta ttc tca gct att gtc ttt ggt gcc atg<br>Phe Gln Asp Val Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met<br>975 980 985         | 2980 |
|    | gca gtg ggg cag gtc agt tca ttt gct cct gac tat gcc aaa gcc aaa<br>Ala Val Gly Gln Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys<br>990 995 1000        | 3028 |
| 45 | gta tca gca gcc cac gtc atc atg atc att gaa aaa agc cct ctg att<br>Val Ser Ala Ala His Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile<br>1005 1010 1015 1020 | 3076 |
| 50 | gac agc tac agc cct cac ggc ctc aag cca aat acg ttg gaa gga aat<br>Asp Ser Tyr Ser Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn<br>1025 1030 1035      | 3124 |
| 55 | gtg aca ttt aat gag gtc gtg ttc aac tat ccc act cga cca gac atc<br>Val Thr Phe Asn Glu Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile<br>1040 1045 1050      | 3172 |
|    | ccc gtg ctc cag ggg ctg agc ctc gag gtg aag aag ggc cag acg ctg<br>Pro Val Leu Gln Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu<br>1055 1060 1065      | 3220 |
| 60 |   |      |

|    |  |                              |
|----|--|------------------------------|
|    | gcc ctc gta ggt agc agt ggc tgt ggg aag agc aca gtt gtt cag ctc<br>Ala Leu Val Gly Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu<br>1070 1075 1080   | 3268                         |
| 5  | cta gag cgc ttc tat gac ccc ttg gct ggt tca gtg cta att gat ggc<br>Leu Glu Arg Phe Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly<br>1085 1090 1095 1100  | 3316                         |
| 10 | aaa gag ata aag cac ctg aat gtc cag tgg ctc cga gca cac ctg ggc<br>Lys Glu Ile Lys His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly<br>1105 1110 1115   | 3364                         |
| 15 | atc gtg tct cag gag ccc atc ctg ttt gac tgc agc att gcc gag aac<br>Ile Val Ser Gln Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn<br>1120 1125 1130   | 3412                         |
| 20 | att gcc tat gga gac aac agc cgg gtc gta tca cat gaa gag att gtg<br>Ile Ala Tyr Gly Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Val<br>1135 1140 1145   | 3460                         |
|    | cag gca gcc aag gag gcc aac ata cac cac ttc atc gag aca ctc cct<br>Gln Ala Ala Lys Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro<br>1150 1155 1160   | 3508                         |
| 25 | gag aaa tac aac acc aga gta gga gac aaa gga acc cag ctc tct ggt<br>Glu Lys Tyr Asn Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly<br>1165 1170 1175 1180  | 3556                         |
| 30 | ggc cag aaa cag cgc att gcc ata gct cgc gct ctt gtt aga cag cct<br>Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro<br>1185 1190 1195   | 3604                         |
| 35 | cat att ttg ctt ttg gat gaa gct aca tca gct ctg gat aca gaa agt<br>His Ile Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser<br>1200 1205 1210   | 3652                         |
| 40 | gaa aag gtt gtc caa gaa gcc ctg gac aaa gcc aga gaa ggc cgc acc<br>Glu Lys Val Val Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr<br>1215 1220 1225   | 3700                         |
|    | tgc att gtg atc gcc cac cgc ttg tcc acc atc cag aat gca gat tta<br>Cys Ile Val Ile Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu<br>1230 1235 1240   | 3748                         |
| 45 | ata gtg gtg ttt cag aat ggc aaa gtc aag gag cat ggc aca cat caa<br>Ile Val Val Phe Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln<br>1245 1250 1255 1260  | 3796                         |
| 50 | cag ctg ctg gcc cag aaa ggc atc tat ttt tcc atg gtc agt gtc cag<br>Gln Leu Leu Ala Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln<br>1265 1270 1275   | 3844                         |
| 55 | gct gga gca aag cgc tagtgaactg tggccatatg agctgttaaa tatttttaa<br>Ala Gly Ala Lys Arg<br>1280  | 3899                         |
| 60 | tatttgtt aaaacatggc atttaatcaa agttaaaagg tgagcactta ctggaaaaac<br>tatgtagaac tacctgtta acatttcttg ctgcaactga agatcattcc accaagttca<br>gagtcttcag atttataat taaaggaacc aaaagaaaca ttatctgtatg gaataaaaata<br>ctggtgttaa ttgcattata aaattataga gtaattcaaa gtagattttg ttaataaatt | 3959<br>4019<br>4079<br>4139 |

gtataatttt tgtttatatt ttatttgtaa cttactgctt tgctgaaaga ttatagaagt 4199  
 ggtaaaaagt actgaatgtt tgaataaaagt gctagctata ataaaactaa acttttatat 4259  
 caaaaaaaaaaaaaaaa aaaaaaaaaaaa

|    |   |  |  |  |
|----|---|--|--|--|
| 5  | <210> 27  |  |  |  |
|    | <211> 1281  |  |  |  |
|    | <212> PRT   |  |  |  |
|    | <213> Canis familiaris  |  |  |  |
| 10 | <400> 27  |  |  |  |
|    | Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu Lys Asn Phe Trp |  |  |  |
|    | 1 5 10 15   |  |  |  |
|    | Lys Met Gly Lys Lys Ser Lys Lys Lys Glu Lys Lys Glu Lys Lys Pro |  |  |  |
|    | 20 25 30  |  |  |  |
| 15 | Thr Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn Trp Leu Asp Arg |  |  |  |
|    | 35 40 45  |  |  |  |
|    | Leu Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile His Gly Ala Ala |  |  |  |
|    | 50 55 60  |  |  |  |
| 20 | Leu Pro Leu Met Met Leu Val Phe Gly Asn Met Thr Asp Ser Phe Ala |  |  |  |
|    | 65 70 75 80   |  |  |  |
|    | Asn Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val Ile Ile Asn Glu |  |  |  |
|    | 85 90 95  |  |  |  |
|    | Ser Ile Thr Asn Asn Thr Gln His Phe Ile Asn His Leu Glu Glu     |  |  |  |
|    | 100 105 110   |  |  |  |
| 25 | Met Thr Thr Tyr Ala Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu     |  |  |  |
|    | 115 120 125   |  |  |  |
|    | Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg |  |  |  |
|    | 130 135 140   |  |  |  |
| 30 | Gln Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln |  |  |  |
|    | 145 150 155 160   |  |  |  |
|    | Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg |  |  |  |
|    | 165 170 175   |  |  |  |
|    | Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Ile |  |  |  |
|    | 180 185 190   |  |  |  |
| 35 | Gly Met Phe Phe Gln Ser Ile Ala Thr Phe Phe Thr Gly Phe Ile Val |  |  |  |
|    | 195 200 205   |  |  |  |
|    | Gly Phe Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser |  |  |  |
|    | 210 215 220   |  |  |  |
| 40 | Pro Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys Ile Leu Ser Ser |  |  |  |
|    | 225 230 235 240   |  |  |  |
|    | Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala |  |  |  |
|    | 245 250 255   |  |  |  |
|    | Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln |  |  |  |
|    | 260 265 270   |  |  |  |
| 45 | Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Ala Lys Gly     |  |  |  |
|    | 275 280 285   |  |  |  |
|    | Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala |  |  |  |
|    | 290 295 300   |  |  |  |
| 50 | Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr |  |  |  |
|    | 305 310 315 320   |  |  |  |
|    | Ser Leu Val Leu Ser Ser Glu Tyr Thr Ile Gly Gln Val Leu Thr Val |  |  |  |
|    | 325 330 335   |  |  |  |
|    | Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly Gln Ala Ser Pro |  |  |  |
|    | 340 345 350   |  |  |  |
| 55 | Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe |  |  |  |
|    | 355 360 365   |  |  |  |
|    | Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly |  |  |  |
|    | 370 375 380   |  |  |  |
| 60 | His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Lys Asn Val His |  |  |  |
|    | 385 390 395 400   |  |  |  |

Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn  
                   405                  410                  415  
 Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly  
                   420                  425                  430  
 5 Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro  
                   435                  440                  445  
 Thr Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile Arg Thr Ile Asn  
                   450                  455                  460  
 10 Val Arg His Leu Arg Glu Ile Thr Gly Val Val Ser Gln Glu Pro Val  
                   465                  470                  475                  480  
 Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn  
                   485                  490                  495  
 Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr  
                   500                  505                  510  
 15 Asp Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr Leu Val Gly Glu  
                   515                  520                  525  
 Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala  
                   530                  535                  540  
 Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Asp Glu Ala Thr  
                   545                  550                  555                  560  
 20 Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp  
                   565                  570                  575  
 Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser  
                   580                  585                  590  
 25 Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile  
                   595                  600                  605  
 Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr  
                   610                  615                  620  
 Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu Ile Glu Leu Glu  
                   625                  630                  635                  640  
 30 Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met Ser  
                   645                  650                  655  
 Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg Arg  
                   660                  665                  670  
 35 Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys Glu  
                   675                  680                  685  
 Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp Arg Ile Leu Lys  
                   690                  695                  700  
 40 Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly Ile Phe Cys Ala  
                   705                  710                  715                  720  
 Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser Arg  
                   725                  730                  735  
 Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg Gln  
                   740                  745                  750  
 45 Asn Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile Ser  
                   755                  760                  765  
 Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu  
                   770                  775                  780  
 Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg  
                   785                  790                  795                  800  
 50 Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu  
                   805                  810                  815  
 Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly  
                   820                  825                  830  
 55 Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly  
                   835                  840                  845  
 Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu  
                   850                  855                  860  
 60 Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met  
                   865                  870                  875                  880

Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly  
 885 890 895  
 Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu  
 900 905 910  
 5 Thr Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln Ser Leu Gln Val  
 915 920 925  
 Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Val Ser Phe  
 930 935 940  
 Ser Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg  
 945 950 955 960  
 Phe Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn Phe Gln Asp Val  
 965 970 975  
 Leu Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met Ala Val Gly Gln  
 980 985 990  
 10 Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala Ala  
 995 1000 1005  
 His Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile Asp Ser Tyr Ser  
 1010 1015 1020  
 20 Pro His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Asn  
 1025 1030 1035 1040  
 Glu Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln  
 1045 1050 1055  
 Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly  
 1060 1065 1070  
 25 Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe  
 1075 1080 1085  
 Tyr Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly Lys Glu Ile Lys  
 1090 1095 1100  
 His Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln  
 1105 1110 1115 1120  
 30 Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly  
 1125 1130 1135  
 Asp Asn Ser Arg Val Val Ser His Glu Glu Ile Val Gln Ala Ala Lys  
 1140 1145 1150  
 35 Glu Ala Asn Ile His His Phe Ile Glu Thr Leu Pro Glu Lys Tyr Asn  
 1155 1160 1165  
 Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln  
 1170 1175 1180  
 40 Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu  
 1185 1190 1195 1200  
 Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val  
 1205 1210 1215  
 Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile  
 1220 1225 1230  
 45 Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe  
 1235 1240 1245  
 Gln Asn Gly Lys Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala  
 1250 1255 1260  
 50 Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Ala Lys  
 1265 1270 1275 1280  
 Arg

55 <210> 28  
 <211> 52  
 <212> DNA  
 <213> Artificial Sequence

60 <220>  
 <223> Synthetic oligonucleotide

|    |   |    |
|----|---|----|
|    | <400> 28  |    |
|    | nntttttttt tttttttttt tttttttttt ttgcggcg acttaagatc tt | 52 |
| 5  | <210> 29  |    |
|    | <211> 27  |    |
|    | <212> DNA   |    |
|    | <213> Artificial Sequence                               |    |
| 10 | <220>   |    |
|    | <223> Synthetic oligonucleotide                         |    |
|    | <400> 29  |    |
|    | ccatcctaat acgactcaact gtagggc                          | 27 |
| 15 | <210> 30  |    |
|    | <211> 34  |    |
|    | <212> DNA   |    |
|    | <213> Canis familiaris                                  |    |
| 20 | <400> 30  |    |
|    | gcaaattgtt caatgttgg ggatgcctgt ccaa                    | 34 |
| 25 | <210> 31  |    |
|    | <211> 33  |    |
|    | <212> DNA   |    |
|    | <213> Canis familiaris                                  |    |
|    | <400> 31  |    |
| 30 | gagctgggtt cctttgtctc ctactctggt gtt                    | 33 |
|    | <210> 32  |    |
|    | <211> 23  |    |
|    | <212> DNA   |    |
| 35 | <213> Canis familiaris                                  |    |
|    | <400> 32  |    |
|    | gcaaattgtt gttgcaggcc tcc                               | 23 |